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THE SKIP STOP AS AN ECONOMY

Since the skip-stop idea has begun to take hold in the electric railway industry we have made several comments upon its time-saving features to the traveling public, and it might be proper to refer to the advantages that it offers as well to the railway companies. To this end it is, of course, necessary to make rather broad generalizations, for the possibilities of the skip stop vary through a wide range even on adjoining lines of a single property, but on this basis it may be said that the gain to the railway is an increase in schedule speed without necessity for any increase in the maximum running speed. This results in a proportional decrease in the number of cars required to do the work, which in turn directly reduces several of the items that comprise the operating expenses, most prominent among these being platform costs. According to the last census report the latter item alone constitutes nearly 30 per cent of the operating expense of the average electric railway, and as the same thing applies to the charges for power, amounting to some 18 per cent more, nearly half of the operating expenses are reduced proportionately to the increase in speed obtained by omitting stops, even neglecting the savings in inspection, insurance, superintendence, and the like, which must follow a decrease in the number of cars. Since the operating expenses average 60 per cent of the revenue, an increase of 10 per cent in schedule speed, which may be reasonably expected from the skip stop, will decrease at least one-half of these expenses by 10 per cent, resulting in a saving equal to 3 per cent of the gross revenue. This is almost one-third of the average net income for the street railways of the country, as shown in the last census, and it is an economy that is well worth the effort involved in its introduction.

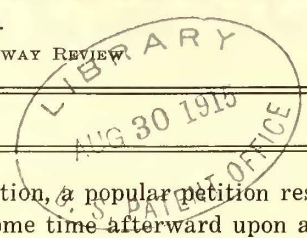
MEETING OPPOSITION TO THE SKIP STOP

The proposed three months' trial of the skip stop on several lines in Milwaukee is a most encouraging sign that the time-saving idea is making headway. Of course, the fact that the Milwaukee authorities are consenting to a short trial by no means establishes a foregone conclusion that the skip stop will be permanently adopted, but it does provide an entering wedge which is bound to exert a future influence even if the present experiment fails to achieve popular support. This is an outcome that is by no means improbable in view of the experience in Denver. Here the skip stop was discontinued on one line by city ordinance, notwithstanding the result of a referendum vote that later showed 70 per cent of the affected householders to be

in favor of its retention, a popular petition resulting in its reintroduction some time afterward upon an adjoining route. In the first case the 30 per cent opposition was sufficiently bitter and sufficiently well organized to influence the local authorities regardless of the wishes of a non-aggressive majority, and this, no doubt, will be a prominent characteristic of the movement elsewhere. To meet it there seems nothing better than a long-continued reiteration of the facts regarding the loss in time that stops entail. For a railway line with a schedule speed of 8 m.p.h., and averaging ten stops per mile, the time spent in stops is of the order of two and one-half minutes per mile—no less than 33 per cent of the whole schedule. A skip-stop plan that saved even one-third of this to the passengers ought to be welcomed by them, and if they really understood the facts there is hardly a doubt but that the innovation would be welcomed.

FARE INCREASES AND REASONABLE RETURNS

It is satisfactory to note that the Massachusetts Public Service Commission has authorized another road in that State to charge 6-cent fares because at the former rate there had been an inadequate return on the stockholders' investment. Some interesting figures are also cited in the decision, showing the traffic before and after similar increases in fares on other roads. These figures show a falling off in number of passengers carried from 2 to 18 per cent in the seven roads mentioned. Of course this does not mean a loss in income; in fact, if the average fare increase in each case was 20 per cent or that from 5 cents to 6 cents it would mean an increase in practically every case. Nor can we assume that the increased fare is the only cause for the loss in traffic, although it might fairly be assumed to be an important reason. Presumably such a loss will be temporary only and until the community served becomes accustomed to the higher price. Then the traffic will resume its normal volume, and the beneficial effect of the rate increase will be appreciable. It may be assumed that there is a more or less fixed volume of traffic which is normal for a given community at a given time. Reductions in rates of fare cannot materially increase this volume nor reasonable increases reduce it permanently. At the same time it must be remembered that the traffic will only bear a certain charge which is set by conditions of competition, inherent value of the service, etc. Along with increasing rates of fare must go amelioration of the tax and other burdens carried by the utilities. When a company is practicing all possible operating economies and providing for the future by proper depreciation allow-



ances, and cannot make ends meet, it is justified in pressing for relief from financial loss in all directions practicable.

INTERNATIONAL ENGINEERING CONGRESS

Two hundred and thirty-nine papers in all are scheduled for presentation at the International Engineering Congress which is to be held in San Francisco during the week beginning Sept. 20. Of these, fifty-eight, or nearly 25 per cent, are from foreign countries, an indication that the congress will be truly international in character. England leads the list with fourteen papers and with her colonies, twenty-three; Italy follows with ten papers, France with six, the Netherlands with five, Sweden and Japan with three each, Argentina, Russia and Switzerland with two each, and Austria and China with one each. This is a good showing in view of the distractions to which foreign engineers are subjected at present. The topics favored by the foreign writers are municipal engineering, irrigation, railway engineering, electrical engineering, mechanical engineering, mining engineering, naval architecture and marine engineering, material of construction and waterways, in the order named.

On page 329 of the issue of this paper for last week attention was directed to the titles of some of the papers which are likely to be of great interest to electric railway men. These were selected from the programs of a number of sections of the congress. While there is no section devoted exclusively to electric railways, papers of interest to workers in this field will be delivered before several sections, such as those on railway engineering, municipal engineering, mechanical engineering, electrical engineering and metallurgy. Among the list of names of writers well known in the electric railway field are those of Sir Albert Stanley, general manager Underground Electric Railways (London, England); George H. Pegram and W. F. Reeves, engineers Interborough Rapid Transit Company; William Barclay Parsons, E. H. McHenry, H. S. Putnam and H. F. Parshall (London, England), consulting engineers, and Prof. L. Luiggi (Rome, Italy), former member Italian State Railway Board.

The subjects considered by these authors are also so varied as to include in a very comprehensive manner the general field of electric railway engineering. Thus, transportation methods, considered broadly, are represented by the papers of Sir Albert Stanley and Mr. Reeves, as well as by those on city planning and streets. Track and way questions are treated directly by Mr. Pegram and indirectly by the papers on electrolysis and electric welding by Professor Ganz and Mr. Auel; heavy electric traction by the papers of Messrs. McHenry, Eaton and Hood; power stations by those of Messrs. Parshall and Putnam and many papers on prime movers, boilers and station apparatus; and the broad problems of utilities in general by the papers of President Humphreys and Mr. Willis of England. These, of course, are in addition to the many other related topics in electric railway engineering which will be discussed by authors of international reputation.

Each nation wishes to be adequately represented in such a symposium of engineering progress, and loyalty to country as well as to profession furnishes an unusual incentive. We may therefore confidently expect that the publications of the congress proceedings will furnish a valuable epitome of the present status of engineering throughout the world.

COURT DECISIONS AFFECTING LABOR

A very useful publication has come from the bureau of labor statistics in the form of a review of 1914 decisions affecting labor. These cover at some length the many new workmen's compensation statutes, employment contracts, hours-of-labor laws, employers' liability and related subjects.

In reading the excellent summary that accompanies the decisions quoted, as well as in looking over the decisions themselves, employers will be forced to a realization of the fact (if they have not already reached this conclusion) that we are now living under a new body of laws and judicial interpretations so far as workmen's compensation is concerned. Under the Michigan statute, for example, it has been held that an employee who injured himself while running to punch the time clock when the noon whistles blew was entitled to compensation. The courts of the State have also held that a workman leaving a roof for lunch at the invitation of his employer and injured while coming down by a way of his own choosing, while other uninvited employees came down safely by another course, was within the protection of the act. The Wisconsin act was held to cover an injury to a workman on the way to the place of his employment. Compensation was allowed under the New Jersey act to a girl who was hurt while combing her hair to remove particles of wool acquired in the course of her employment in a mill.

A new twist in the fellow-servant doctrine, now modified or entirely changed by statute in several states, is found in a North Carolina case. There it was held that the incompetence of a fellow servant was the cause of the liability of the employer, the court stating that a workman assumed the risk of negligence of his fellow servant but not of the negligence of the employer in selecting incompetent employees. Extended and developed as many decisions of this character have been, it may readily become a rule that injuries resulting from what it is easy to show is the "incompetence" of a fellow servant are chargeable to the employer. Placing incompetents in positions where they endanger other employees is evidently as unsafe as it is indefensible.

One of the Supreme Court decisions reported emphasizes the value of this review to electric railway managers in particular. In this case (*Smith vs. Texas*) the court held unconstitutional a Texas statute restricting the employment of railroad conductor to persons of certain specified experience, it being decided that the requirements were arbitrary and unreasonable and so in violation of the fourteenth amendment. The application of this decision to laws which seek to prevent electric railways from employing non-residents or others who may be available during strikes is clear.

It is not so much, however, the direct application of many of these decisions to the railway business that makes this review of great importance; it is the insight given into the later interpretation of laws which change the whole structure of employers' liability and workmen's compensation, define the responsibility of labor unions (as exemplified in the Hatters' case and others) and put on a new basis such issues as were involved in the interpretation of the Kansas statute which sought to make it unlawful for an employer to require of employees that they should not be members of labor organizations. Justice Pitney's opinion in the latter case (*Coppage vs. Kansas*) is a veritable employers' bill of rights.

BROADER STANDARDS IN TRAINING MEN FOR PLATFORM SERVICE

The new schoolroom of the Brooklyn Rapid Transit System, described elsewhere in this issue, is a splendid example of effective co-operation between the transportation and mechanical departments of that company in broadening the instruction of platform men. Time was when a man was declared a full-fledged motorman or conductor on the strength of a week's platform training under men who knew but little themselves. In those days non-technical men in the transportation department were responsible for the curriculum, and but little thought was given toward achieving economical operation and avoiding the abuse of equipment. If the motorman made his schedules without accidents and if the conductor gave an honest accounting, no more was expected of them.

That these requirements must now be exceeded is evident from a survey of instruction practices devised during recent years. The skeleton car and dummy stand have been supplemented by complete floor layouts of the standard equipments so that each part can be inspected and explained in detail; simplified wiring diagrams and demonstration boards have been devised to show the course of current from trolley to rail in an interesting way; moving-picture scenarios have been written to point out the consequences of wrong and of right operation; tracks have been built for trial runs and, as at Brooklyn, even full-section car models and portions of track and line construction have been incorporated.

The elaborate equipment which has been assembled by the Brooklyn company is not for the purpose of making expert mechanics of the platform men, but to make them appreciate the correct use and value of the electro-mechanical equipment placed in their charge. If the new Brooklyn school will produce a larger proportion of men who can meet schedules without baking armatures and make stops without excessive use of brakeshoe metal, the money that the school has cost will soon prove well spent. Yet the excellent work that this school can do for the benefit of the mechanical department is but a trifle compared to the excellent results it can achieve in lower energy consumption, in decreased number of accidents and in fewer interruptions to the service.

DISARM THE YELLOW JOURNAL WITH FACTS

Newspaper reporters as a rule dote on the sensational side of any accident regardless of how trivial it may be, but after all they are human and generally have the layman's viewpoint. This was clearly demonstrated recently when two trains on the Elevated Railroads of Chicago came together in an insignificant collision at a point near one of the Chicago River bridges. An accident as slight as this would ordinarily have been instantly forgotten. Unfortunately, this trivial collision immediately followed the sinking of the steamer *Eastland* in the Chicago River, since which disaster the Chicago public has been working under a nervous tension that is reflected in every phase of the transportation business. Newspapers took advantage of this situation and emphasized the sensational side of this collision, dwelling upon what might have occurred if the river bridge had been open and the car had been pushed off the end of the structure.

Undoubtedly the yellow journalist made a deep impression upon his readers, but to counteract this President Budd of the Elevated Railroads immediately requested the manager of one of the prominent Chicago morning newspapers to send a reporter to examine the entire situation in detail. The request was granted and the reporter was taken in tow by the electrical engineer and the engineer of maintenance of way, and every phase of the accident was carefully explained to him. He was then taken to the site of the accident, where the various functions of the interlocking plants which protect all bridges were carefully demonstrated, as well as all the auxiliary protective devices which each plant controlled. Fortunately while the reporter was in the tower a signal indicating that the bridge was to be opened was received. This, of course, necessitated the sequence of operations required to protect traffic before the bridge could be turned from its normal position. As he watched these operations the reporter was deeply impressed with the great number of protective devices installed to safeguard the public. Armed with these facts he returned to his desk and worked up a half-column article in the usual sensational style. The sensational feature in this case, however, consisted in showing how mechanically impossible it was for a train to plunge into the river, and how untruthful were the reports contained in his competitors' newspapers.

This incident seems to indicate that when a newspaper is not obsessed with the idea of disparaging public utilities in general, the reporters and editors are open to conviction. It is certainly a good policy for the railway managers to devote sufficient time and attention to furnishing newspaper reporters, and in turn the public, with the facts. It is particularly important that these facts be presented so as to be clearly understood by the layman. As a rule a layman is more easily convinced by a demonstration, and undoubtedly so it is with newspaper reporters, who cannot always be expected to understand a technical description given from the office desk. The reporter is liable to construe such a technical description as "bunk" and proceed to write a sensational story drawn from his own imagination.

A Modern Railway School

In the New Surface Car Schoolroom of the Brooklyn Rapid Transit System the Operation and Equipment of Each Important Type of Car Is Taught by Means of Full-Section Models—Moving Pictures and a Miniature Trolley-to-Rail Demonstration Board of Original Design Are Among the Instructive and Interesting Features

The Brooklyn Rapid Transit System completed this past spring, after nine months' work, a most extensive and modern surface railway school, chiefly for the instruction of platform men. The location of the old school, at Fifty-eighth Street and Second Avenue, was retained on account of the facilities on Second Avenue for the road instruction of the men in connection with their work at the school. The new school occupies approximately three times the space of the former school, or more than 5000 sq. ft. of floor space. It comprises a conductors' room, motormen's room with apparatus, and the office of the supervisor of instruction.

The installation is most attractive and substantial, all layouts being of steel as far as possible, while all wiring is inclosed in conduit pipe.

As first impressions are often lasting, the very entrance to the school has been laid out in a way that will place the students in a friendly and receptive mood. On entering the office of the supervisor of instruction they will see some tastefully-grouped photographs which illustrate different features of B. R. T. employees' welfare work. Here, for example, they see the interiors of the several welfare centers with their restaurants, reading rooms, pool tables, bowling alleys, electric driers for clothing, etc. Thus they are impressed with the fact that the relations with their future employer will have human as well as business aspects. Groups of safety campaign pictures framed uniformly serve to impress the new men that the physical well-being and consequently the happiness of many passengers will lie largely in their care.



BROOKLYN SURFACE CAR SCHOOL—INSTRUCTION SLIDE TO SHOW POSSIBLE DANGER OF FORBIDDEN TALKS



BROOKLYN SURFACE CAR SCHOOL—INSTRUCTION SLIDE SHOWING HOW CONDUCTOR CAN AID PASSENGERS

The new school is the result of co-operation of the operating and mechanical departments throughout, William Siebert, superintendent of transportation, designating E. C. Clarke, supervisor of instruction, in charge for the operating department, and W. G. Gove, superintendent of equipment, designating O. T. Kreuser as engineer in charge for the mechanical department, to design and care for the work involved.

All construction was handled by the company, the engineer of way and structure caring for the remodeling of the building and heating, the line department for the illumination, and the Fifty-second Street surface shops for the makeup and installation of the equipment and apparatus.

The stationary equipment hereinafter described is to be supplemented by a specially designed and equipped instruction car which will be operated over the system on regular schedule, for any specific purpose or for any reinstruction found necessary at the different operating depots.

As each class of motormen or conductors is taken in hand by the supervisor of instruction he addresses them briefly on the scope of their duties, on the possibilities of their future career, on the functions and value of the Employees' Benefit Association, and on the need for safe operation and courteous treatment of their patrons. The classes then go to their respective rooms for the instruction hereinafter described.

CONDUCTORS' ROOM

The room for conductors is equipped with fifty-four benches and desks of the public school type. It is devoted chiefly to instruction in fare collection, in the preparation of reports, and in such other matters as cannot be demonstrated on the full-section car models in the motormen's room. As accompanying views show, the conductors' room has no other mechanical apparatus than two frames with cash and transfer registers thereon, including ringing devices. The use of signal bells and cords is also shown. The register frames are



BROOKLYN SURFACE CAR SCHOOL—INSTRUCTION SLIDE SHOWING HOW A WAGON MAY OBSCURE VIEW OF PLAYING CHILDREN



BROOKLYN SURFACE CAR SCHOOL—INSTRUCTION SLIDE SHOWING CONDUCTOR'S CORRECT POSITION WHEN PUNCHING TRANSFERS

mounted on the instructor's platform at the front of the room. Behind him and on part of the side walls are blackboards. Enlargements of the principal report forms used by conductors, such as the day sheet, general time slip and car-service time slip, are painted on part of the side wall blackboards to permit the instructor to illustrate his talk. The use of other forms, such as accident reports, is also illustrated and taught to the men.

In addition to the instruction of this formal character, a more attractive and unusual form of teaching is afforded by the use of a series of stereopticon slides, the room being equipped with a stereopticon machine and spring roller curtain. These slides show enlarged views of the register dials, the correct positions that the conductor should assume in registering fares, in issuing transfers and in assisting passengers to enter or alight. The slides also illustrate the need for constant watch of street conditions to avoid accidents to persons and collisions or side-wipes with vehicles. Moving pictures of the same tenor, including the now famous "Price of Thoughtlessness," are also used.

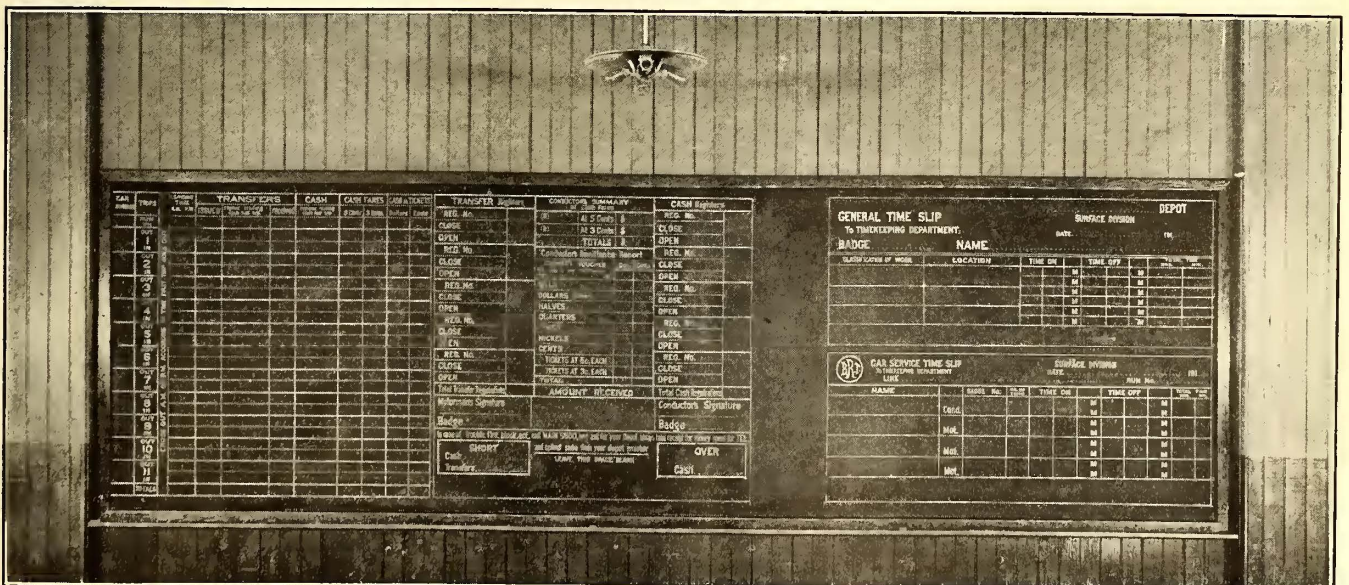
Although, as noted, the embryo conductors can be handled up to classes of fifty-four, the instructor does

not remain constantly on the platform or at the blackboards but is always prepared to give individual instruction to the more backward students. Moreover, all the pupils are supplied with a series of pamphlets whereby they can refresh their memories of the knowledge gained in the classroom.

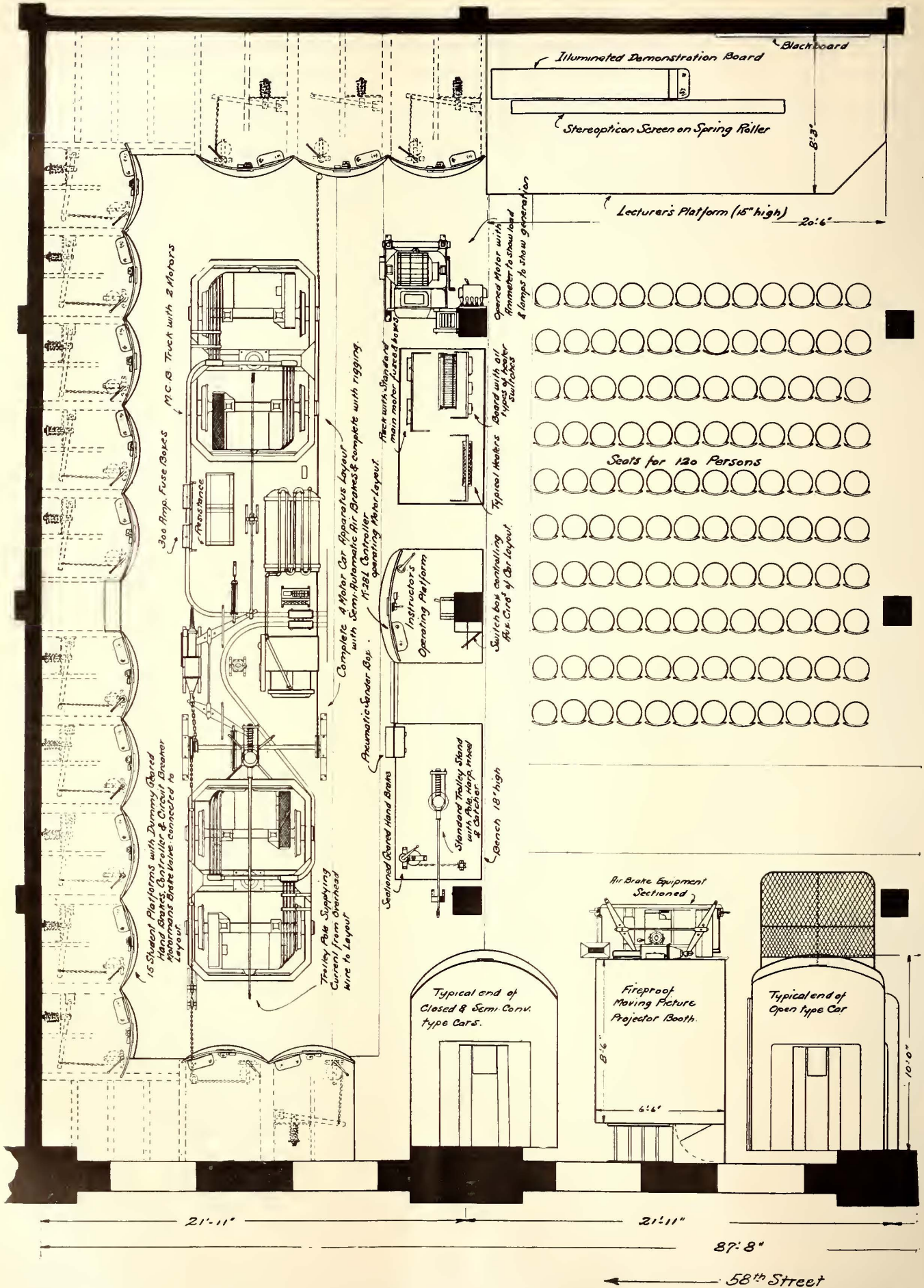
MOTORMEN'S ROOM

As the recruit motormen and conductors enter the motormen's or apparatus room, they are likely to be bewildered by an array of car equipment so extensive that it looks like an electric railway convention exhibit on but a slightly reduced scale. Yet, a few minutes' inspection will convince the visitors that they have before them an attractive as well as an instructive array of apparatus and equipment. In fact, news of the very elaborate outfit of this school has brought to the room many car platform veterans who have come on their own time to get a clearer idea of the apparatus that they handle every day. On a recent day, for example, 120 regulars visited the school.

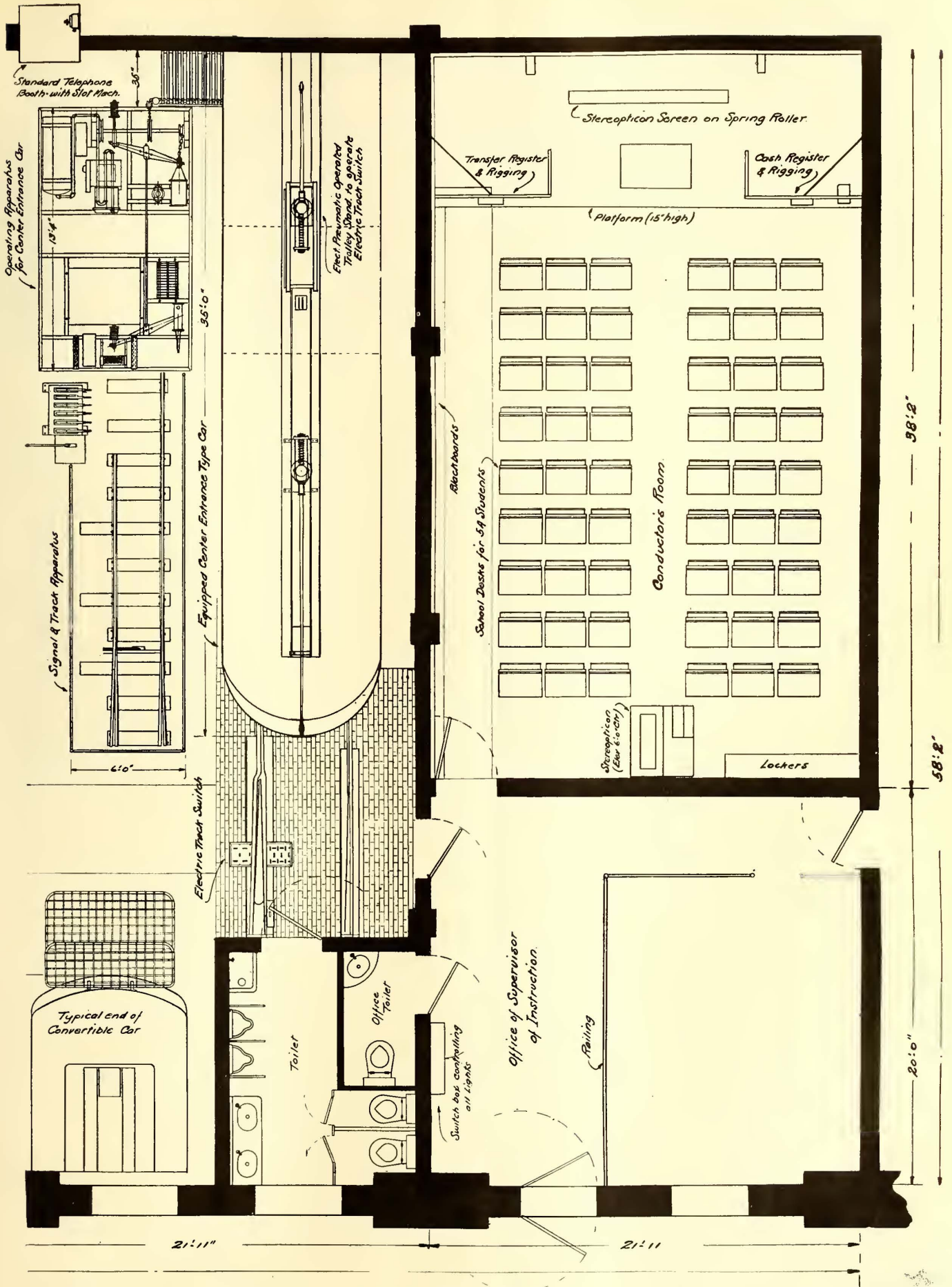
The motormen's room contains all the working apparatus, equipment and car sections beside the audi-



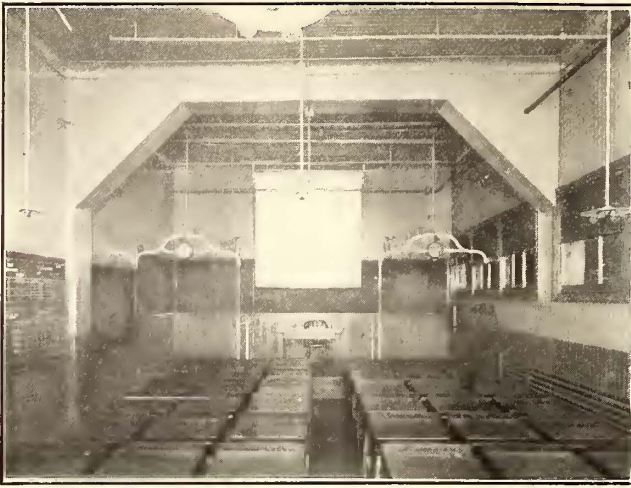
BROOKLYN SURFACE CAR SCHOOL—ONE SIDE OF THE CONDUCTORS' CLASSROOM SHOWING ENLARGED REPORT FORMS



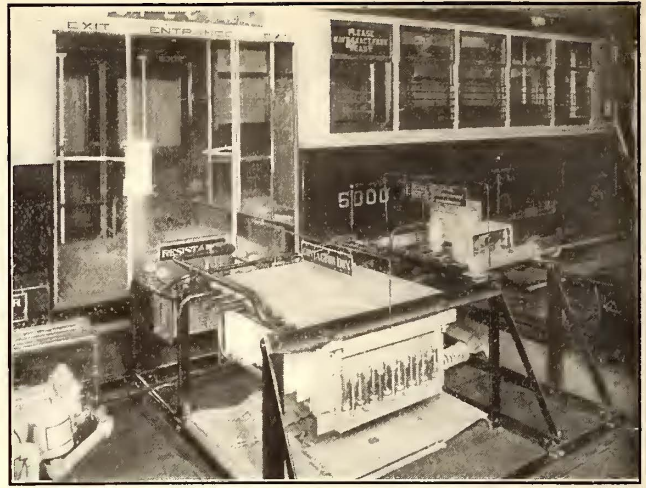
BROOKLYN SURFACE CAR SCHOOL—PLAN OF NORTHERN HALF OF SCHOOL LAYOUT SHOWING AUDITORIUM, FULL-SIZE SECTIONS OF TWO TYPES OF CARS, FIFTEEN DRILL PLATFORMS, INSTRUCTOR'S PLATFORM, COMPLETE FOUR-MOTOR OPERATING EQUIPMENT AND DISPLAY STANDS



BROOKLYN SURFACE CAR SCHOOL—PLAN OF SOUTHERN HALF OF SCHOOL LAYOUT SHOWING CHIEF INSTRUCTOR'S OFFICE, CONDUCTORS' ROOM, MODEL CENTER-ENTRANCE CAR, ELECTRIC TRACK SWITCH, SIGNAL OUTFIT AND FULL-SIZE SECTION OF CONVERTIBLE CAR



BROOKLYN SURFACE CAR SCHOOL—INTERIOR OF CONDUCTORS' CLASSROOM WITH STANDS FOR REGISTERS



BROOKLYN SURFACE CAR SCHOOL—CONTACTOR AND OTHER EQUIPMENT ALONGSIDE CENTER-ENTRANCE CAR

torium, which has individual seats for 120 persons, a lecturer's platform and a moving picture booth and equipment for illustrating lectures.

FULL SECTION CAR MODELS

As shown on the accompanying plan, immediately on entering the room the visitors will observe at their left a series of three full-size sections of the general types of drop platform cars used in Brooklyn, comprising the cross-seat convertible four-motor type car, the semi-convertible closed two-motor type car, and the open car. Each model is 10 ft. long, so that it comprises not only a complete and operative vestibule but has also enough interior to show the seating arrangement, the location of register mechanism, signal cords, and positions of most company announcements; also all bulkhead fittings, including curtains and the door mechanism. In the case of the convertible car, one side is shown with summer sash and the other with winter sash, while the open car has the regulation standard running boards and guard bars which can be raised and lowered. This car also has a composite platform equipment, representing the heavier open cars which have air brakes and pneumatic sanders in addition to the standard geared hand brakes, while the lighter cars of this type are without air brakes and have mechanically-operated sand boxes.

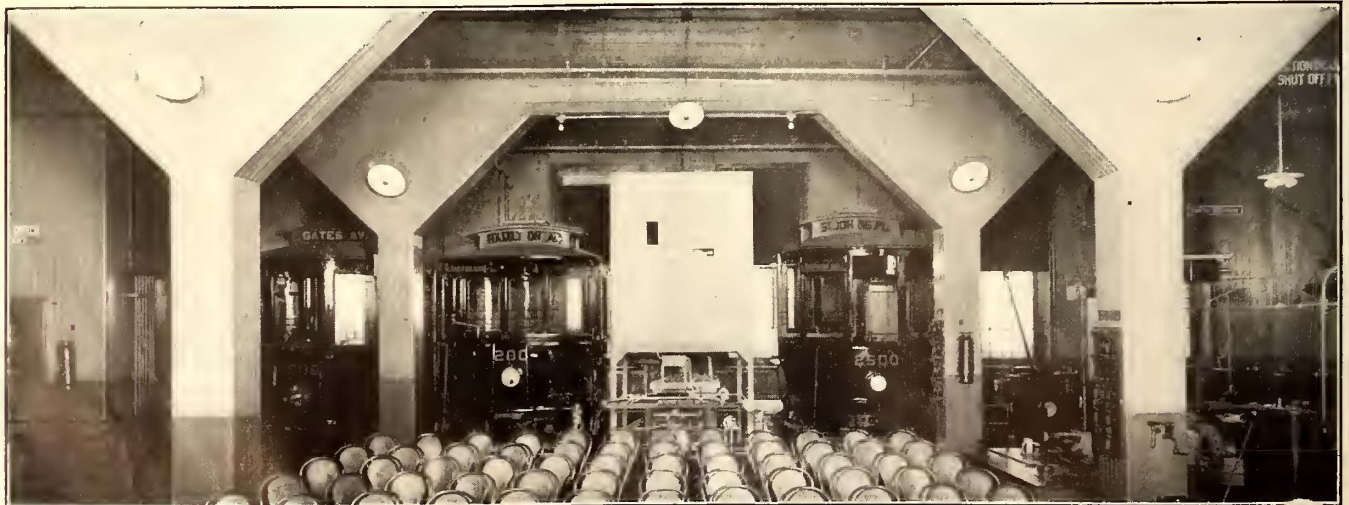
While, of course, the models are not movable, the

vestibules and platforms are fitted with every part of the equipment in its standard location, such as the switch boxes, controller brake staff and ratchet, brake valve, conductor's emergency valve, record card holder, etc. Many of the items bear metal signs to accustom the men to call things by their proper names so that, for example, a man will not refer to a contrivance as a wheelguard when he means a fender. The drills which the recruits receive on these models help to teach them their proper position on the cars and the correct operation of controllers, brakes and circuit breakers, closing or fastening of platform gates, adjustment of fenders and wheelguards, and the use of the switch irons, foot gong, conductor's emergency valve, etc., also the proper position and methods for the registration of fares and the transmission of signals.

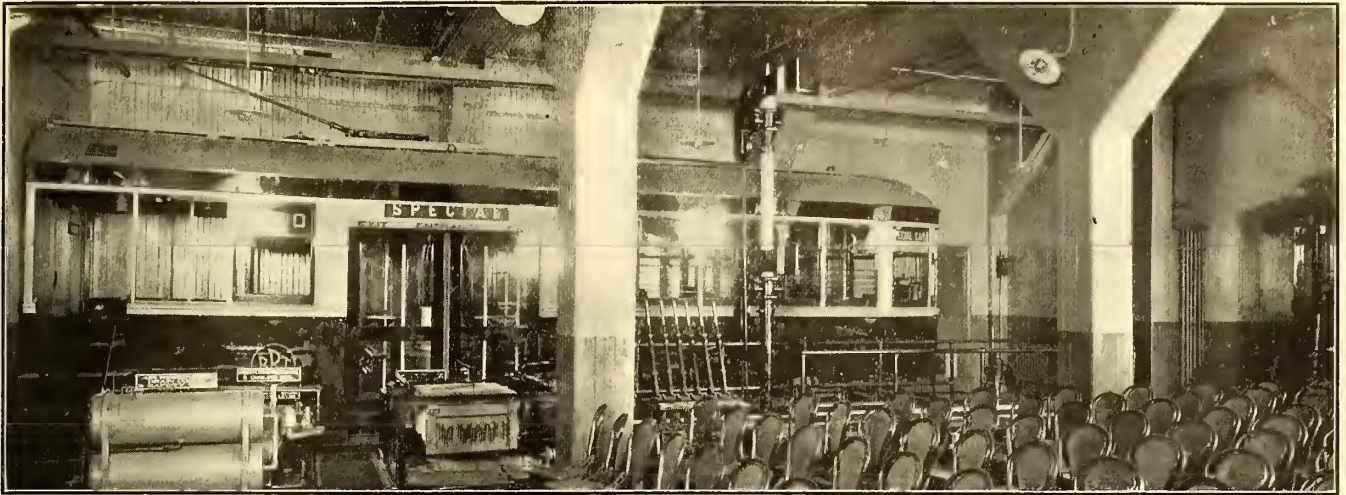
The wheel-guard equipment has also been comprehensively covered, showing the two different types used in Brooklyn, and demonstrating their operation and the proper use of the emergency hooks during heavy snow storms, or when the guard becomes damaged. The two standard types of fenders also are shown, and instruction is given in their proper handling. The proper location and use of drawbars are also covered.

THREE-QUARTER MODEL OF CENTER-ENTRANCE CAR

To teach the men the use of the center-entrance car it was deemed desirable to build a three-quarter length, full-section model of the body in order to include the en-



BROOKLYN SURFACE CAR SCHOOL—REAR OF THE AUDITORIUM, SHOWING THREE FULL-SIZE SECTIONS OF CARS AND THE MOVING PICTURE BOOTH



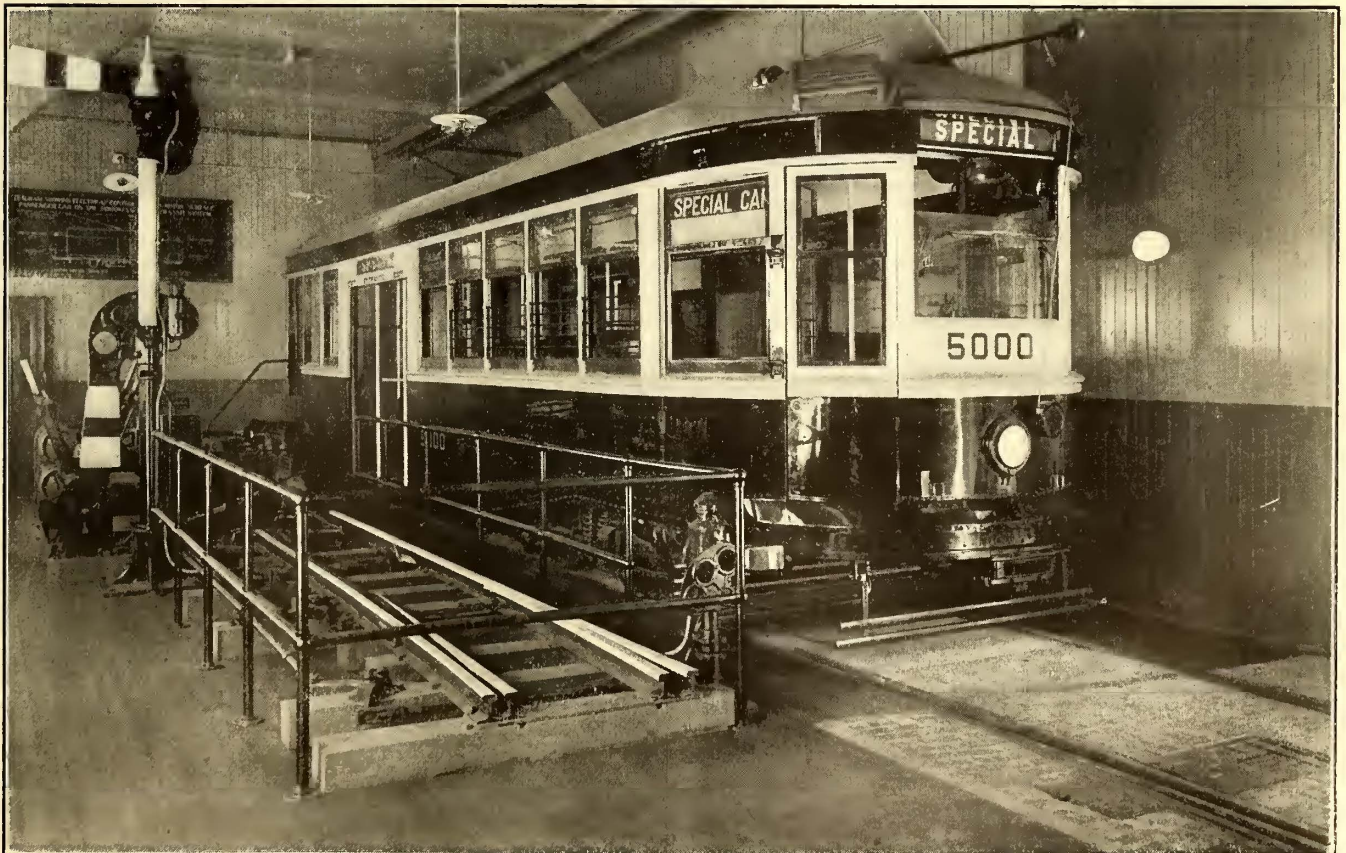
BROOKLYN SURFACE CAR SCHOOL—SIDE VIEW OF THREE-QUARTER LENGTH CENTER-ENTRANCE CAR SHOWING LAYOUT OF EQUIPMENT ALONGSIDE, SPECIAL TRACK AND STUDENTS' STAIRWAY AT THE REAR

tire well construction and the ramps leading therefrom. In short, this model, which is built of steel, is a faithful replica of an actual car except that a portion of the seating is absent to give room for class instruction and to permit the exposure of the electropneumatic operation of the doors. Further, the working of the door-operating mechanism by hand or air is visible through the screens which replace the usual steel casing at this point, and a portion of the ceiling remains open to show the duct and fan motor used in the vacuum ventilating system.

Unlike the other models, this car is equipped with all the electrical and pneumatic apparatus connected and working. However, all the equipment ordinarily used

under the cars and consisting of the contactor box, resistors, relays, air compressor, governor, tanks, brake cylinder, slack adjuster, brake rigging, etc., is installed beside the car on the floor in approximately the same relative positions that the parts have under the operative cars. This permits ready inspection and examination. Following the practice applied throughout this room, each piece of apparatus is neatly finished in light colors and bears a metal sign with its name or identifying number, like the following: "Contactor Box"; "Air Reservoir, Drain Cocks and Safety Valve"; 1—"Control Resistance," 2—"Control Relay," etc.

The roof of the car is equipped with two trolley poles connected as in service, the entire equipment obtaining



BROOKLYN SURFACE CAR SCHOOL—THREE-QUARTER LENGTH MODEL OF CENTER-ENTRANCE CAR WITH AUTOMATIC TRACK SWITCH IN FRONT AND SIGNAL MECHANISM ALONGSIDE THE FRONT HALF OF THE CAR

its current from a standard trolley wire overhead. The rear pole in addition has a sliding device, used in connection with the electric track switch located ahead of the car.

In the case of the center-entrance car, therefore, the equipment is operated from the cab in such fashion that when the students are on the floor they can see what takes place in the main control and braking apparatus. Further, they can see the workings of the several safety relays which prevent opening of doors when power is applied as well as the opening of the control current when doors are open. Other operations observed by the pupils are fare collection, door operation, response to door and buzzer signals, automatic control of heaters by means of the thermostat, proper use of switches, replacement of fuses, etc.

TRACK SWITCH AND SIGNAL INSTRUCTION

The use of the electric automatic track switch is taught in connection with the operation of the center-entrance car equipment. A suitable area in front of this car is paved and equipped with a complete operating electric track switch. Placed on the wall to face

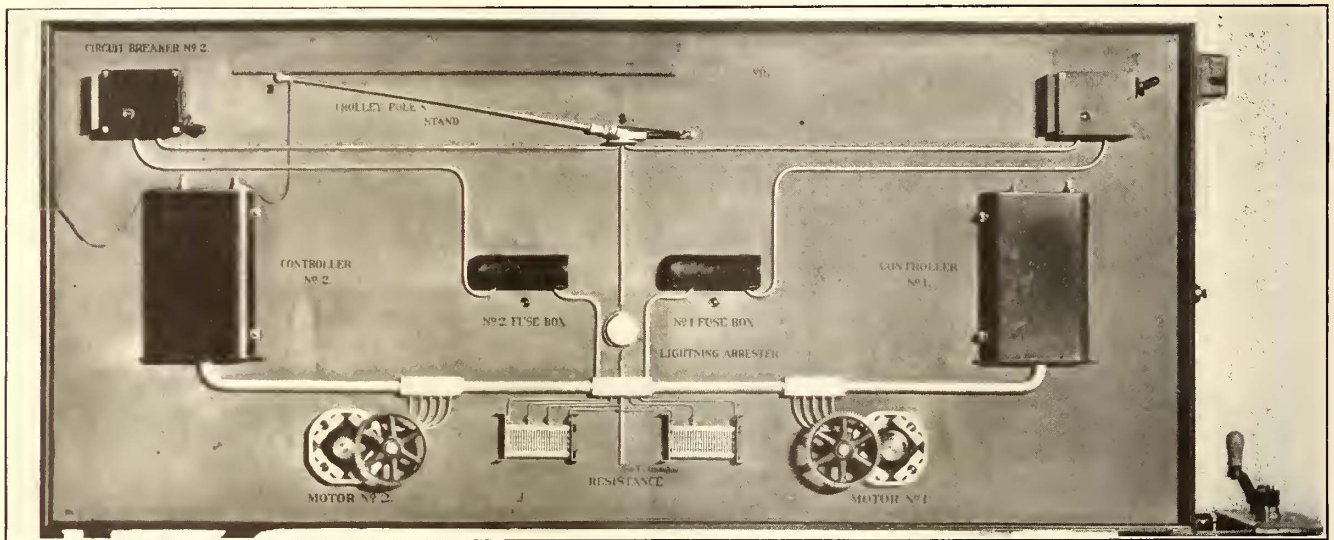
cars are operated over elevated tracks. As one of the illustrations shows, the equipment includes a dwarf signal, two-arm semaphore and switch levers with mechanical locks.

DESCRIBING THE COURSE OF THE CURRENT

The demonstration board which has been devised to show the course of the current and the operation of the control equipment from the point of entrance at the trolley wire to the point of return at the rail, is most ingenious and instructive. It is built of steel and ebony-impregnated asbestos and is placed in the front of the auditorium section on the lecturer's platform.

The accompanying illustration of the front of the board shows that it is laid out for a two-motor equipment with the usual appurtenances in miniature, all suitably designated. The energy for operating the devices on the board and for its lighting effects, is obtained by means of the trolley wire on the board and a standard K-11 controller with a special geared supplementary drum, carrying twenty-five fingers.

It will be seen that by use of the trolley cord a miniature trolley pole and stand of metal can be put in or



BROOKLYN SURFACE CAR SCHOOL—MODEL BOARD SHOWING THE COURSE OF CURRENT FROM THE TROLLEY TO GROUND

the motorman is the standard warning sign "Electric Switch—100 ft.," used in connection with automatic switches. As the car itself cannot be moved, the rear trolley stand and pole are moved to produce the same condition that arises when the current collector of a moving car enters the insulated section of the overhead contactor which is used in operating the automatic switch. The trolley stand is mounted on a ball-bearing track and returns to its normal position automatically. This movement of the trolley stand is obtained by means of electropneumatic mechanism similar to that of the center doors. This mechanism is operated by the instructor from a push button in the cab.

The students are shown that for straight rail the car must be run over the switch without power, while for taking the switch they should apply power only on the first point of the controller. The instructor meanwhile presses the button provided, which causes the trolley pole to move past the contactor located on the trolley wire and to cause the track switch to throw automatically. Of course, the proper throwing of switches by hand is also taught.

A portion of the space alongside the center-entrance model is employed for an exhibit of the signals which are used on those portions of the system where surface

out of contact with the strip of copper which is the source of all power supply. When the main switch is in, energizing the trolley wire and the trolley wheel placed against the wire, small cut lenses are illuminated at the trolley pole and stand, showing the live condition of these parts. When the circuit breaker is cut in, the lamp at that point is lighted as well as the one at the fuse box, and when the controller is opened the slots representing the trolley fingers are also illuminated, showing the live condition of all the various apparatus to that point.

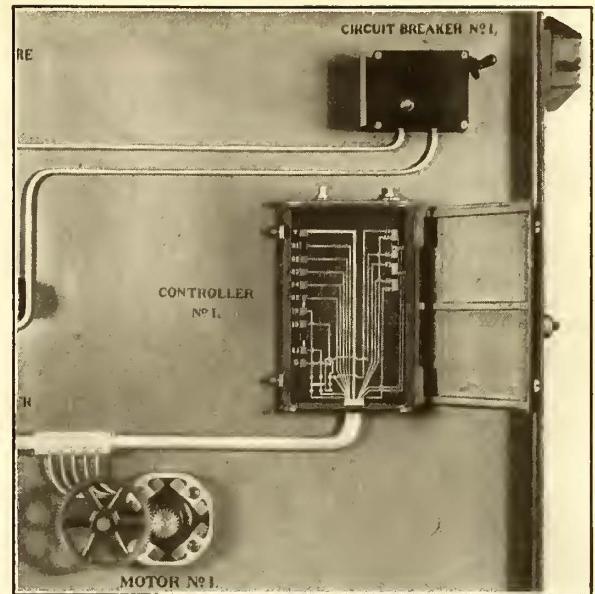
Near the base of the board are cross-sections of two four-pole motors which are also arranged with lenses illuminated to various intensities. The shafts of these sections are extensions of the shafts of real motors installed behind the board. Each extended shaft carries a pinion which meshes with a corresponding gear. As the controller handle is turned, the slots inside the miniature controller are illuminated showing the various combinations of connections in the controller and the motor armature and gearing. The connections made in the real controller at each notch and the path of the current through the real, though concealed, resistors are ingeniously shown in the miniature controllers (the covers of which are hinged) by adapting the punctured-

roll principle of automatic piano players and by throwing lamps in or out of circuit by means of the contacts on the supplementary drum.

This third drum in the operating controller is used to secure the lighting, current flow and heating effects shown on the front of the board. When so employed, several banks of lamps behind the board are placed in circuit, but their illumination cannot appear on the front of the board because intervening brass screens cut them off from all openings. These brass screens, however, are perforated at such intervals that at each notch of the controller the various slots, of which there is one for each controller finger, are either covered, shutting off the light, or uncovered, permitting light to shine through and show the "live" condition. The screens are moved mechanically by means of a pinion and rack which is actuated through gearing on the K-11 controller. The slots representing the fingers have their connections painted and lettered so that the path of the current from the energized fingers can be readily traced out to the main cable through the resistors and motors. By the use of red lamps behind the miniature resistors a simulation of their heating is obtained, each point of resistance having a separate screened lamp put in or out by means of the supplementary drum at the proper time. The board is operated directly on the regular 550-600-volt circuit, and the lamps used are 23-watt and 10-watt, with five or more in series.

The demonstration board is supplemented by a diagram on which the circuits and apparatus are shown in heavy white lines against a faint outline of a two-motor car to indicate the position of each piece of apparatus on the car. The diagram also bears the necessary explanatory words and phrases to make it as clear as possible.

A modern moving picture and stereopticon equipment with a steel and asbestos booth placed between two car



BROOKLYN SURFACE CAR SCHOOL—DETAIL VIEW OF BOARD, SHOWING INSIDE OF MINIATURE CONTROLLER, GEARING AND SECTION OF MOTOR

models and elevated above the floor is another feature of the auditorium section. The special resistors necessary to reduce the 550-600-volt current are located in a housing under the booth and these, as well as the booth, are ventilated by means of a duct. A buzzer circuit enables the lecturer to signal the picture operator concerning changes in slides or films. A large spring roller curtain for images up to 12-ft. square is provided over the lecturer's platform for use with the stereopticon equipment.

DEMONSTRATING MOTOR

At the left of the instructor's platform is an opened GE-800 motor with a K-11 controller, standard resistors, circuit breaker, ammeter and bank of lamps above the breaker. A foot brake and brake drum are provided to demonstrate with the help of the ammeter how the energy consumption of the motor is increased when it is running against brake friction.

As this motor is open the explanation of the function of its various parts is understandingly made. This motor is also arranged to be operated as a generator by permitting the armature to spin and then throwing the circuit breaker and reversing the controller. Visual evidence of generation is afforded by means of the lamp bank which is momentarily lighted by the current generated. The brush-holders and revolving armature as well as all resistors are protected to prevent anyone making contact with them.

HEATERS, FUSES AND OTHER DETAILS

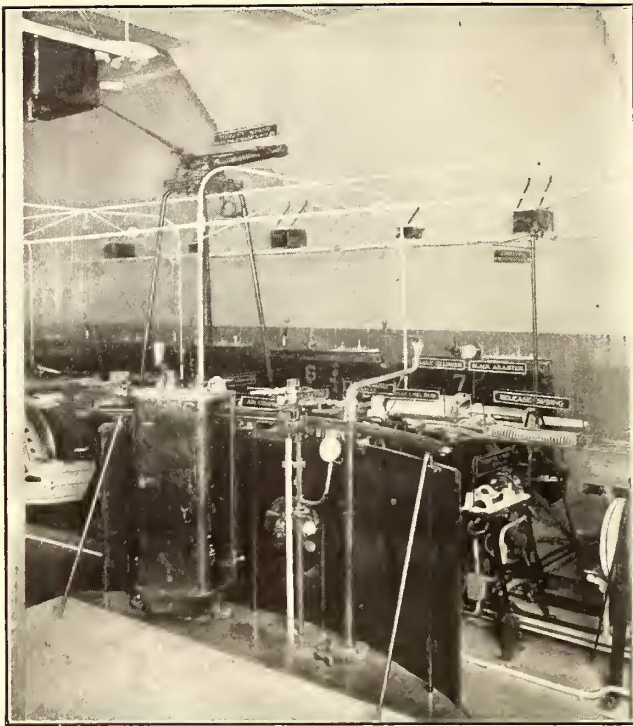
Directly in line with the demonstration motor is a rack showing the company's different types of heater switches, with and without covers. These are used to teach the correct way of cutting heaters in and out in operation. On the same stand and in electrical connection with the switches are one cross-seat and one panel heater.

On the opposite side of the same stand are mounted a group of 150-225-300-amp cartridge and one-ribbon type of motor fuse. Here the students are shown how to insert fuses correctly and to distinguish between the different sizes.

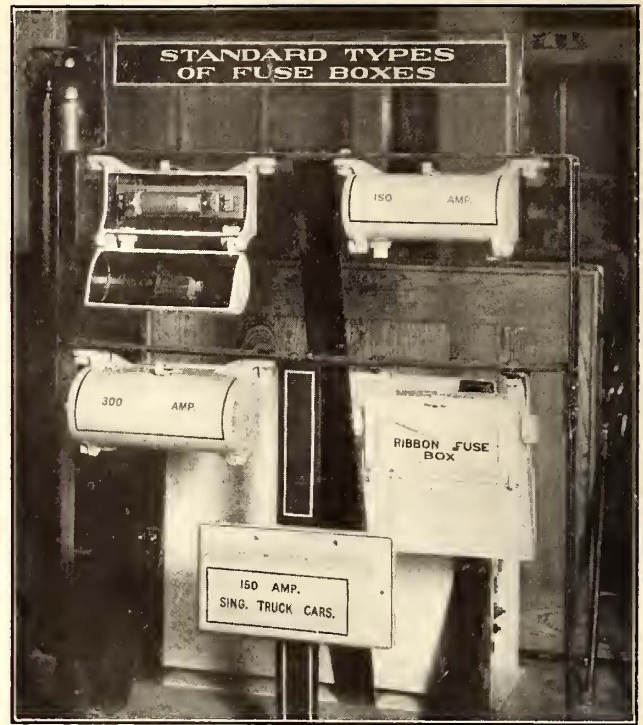
Boards are also provided on the columns for carrying the controller and air-brake handles used for the



BROOKLYN SURFACE CAR SCHOOL—TEST EQUIPMENT WITH AMMETER AND BANK OF LAMPS TO ILLUSTRATE USE OF MOTOR AS A GENERATOR



BROOKLYN SURFACE CAR SCHOOL—INSTRUCTOR'S PLATFORM WITH PORTION OF OPERATING FOUR-MOTOR EQUIPMENT



BROOKLYN SURFACE CAR SCHOOL—DISPLAY OF DIFFERENT STANDARD TYPES OF FUSE BOXES

students' dummy platform outfits hereinafter mentioned. Each handle is stamped with the number of its location, partly for convenience and partly to inculcate the student's mind with the absolute need for orderliness.

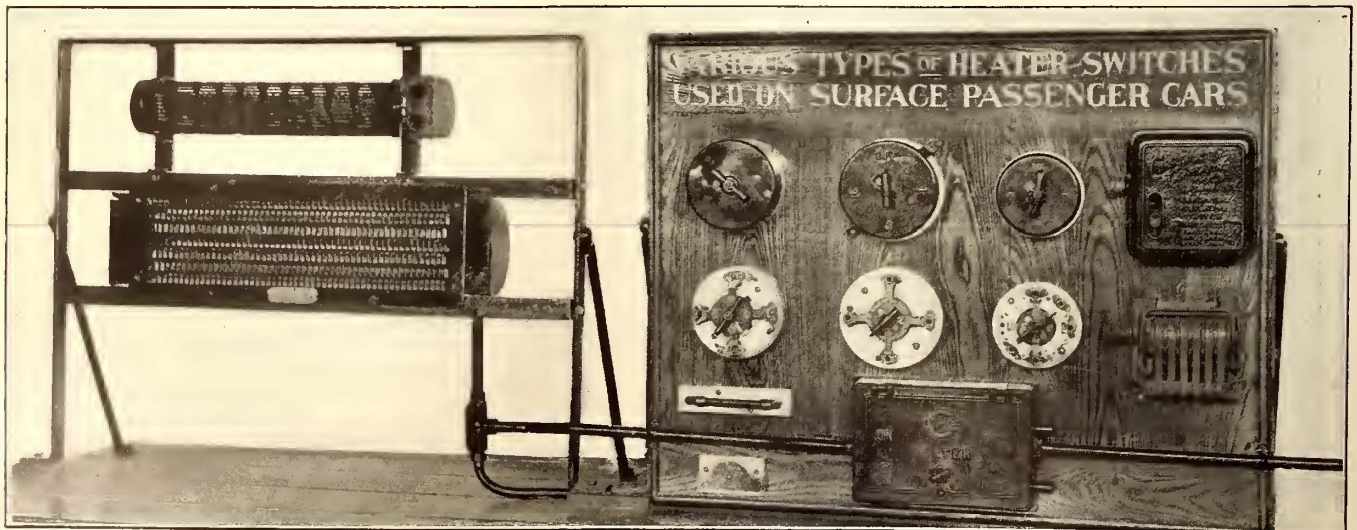
Another display bench, 18 in. high, carries a complete current-collecting outfit made up of a trolley base, pole, harp, wheel and catcher. The instructor shows how emergency repairs can be made to current collectors quickly and safely. The same bench has a geared hand brake which is standard for Brooklyn cars, cut in section to show the features of its design, and a pneumatic sand box in operating condition.

A more elaborate detail equipment is that of a complete semi-automatic surface-car air-brake equipment with live and dead levers, connecting rod, pneumatic sand box, slack adjuster, etc. All the apparatus and

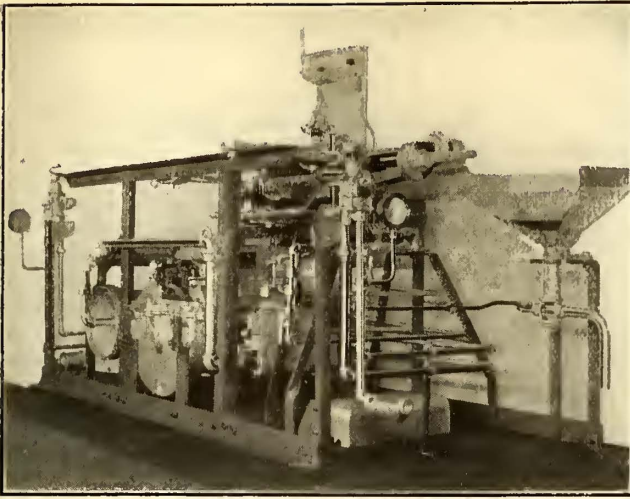
pipings are cut in section so that the instructor may describe the internal operation and connections. This equipment is used not only for the enlightenment of platform recruits but also for men from the maintenance forces of the company.

DRILL PLATFORM INSTRUCTION

For instruction in the correct handling of controllers, fifteen drill platforms have been equipped with dummy geared hand brakes, controller, circuit breaker and foot gong, but with operative motorman's brake valves. The stands are so placed that all members of the class at drill can see every move of the instructor, whose own stand comprises operating equipment throughout. Between the instructor and his class is installed a complete four-motor car apparatus layout, including semi-automatic air brakes, whereby the instructor demon-



BROOKLYN SURFACE CAR SCHOOL—SPECIMENS OF THE DIFFERENT STYLES OF HEATER SWITCHES AND HEATERS USED ON SURFACE CARS



BROOKLYN SURFACE CAR SCHOOL—SECTIONALIZED AIR-BRAKE AND PNEUMATIC-SANDER EQUIPMENT

strates the different features of controller and brake operation.

The trucks of the M. C. B. type are raised off the floor and are equipped with two GE-800 motors, each of which has been rewound for slow speed since they are run without load. They operate with noiseless fiber pinions. As the air brake is operative from the valves on all sixteen platforms, a compressor of extra large capacity is used. The brake equipment consists of governor tanks, cooling coil, emergency valve, brake cylinder, slack adjuster and conductor's valve completely connected with the standard foundation rigging right to the trucks.

To simplify instruction the following features have been incorporated: Different colors for the various circuits and air pipes; illumination for each point of the screened resistors to show what resistance grids are in

circuit; a double-face gage on the brake cylinder to show the entire class how much air has been used in different applications; a turnbuckle in one of the pull rods to illustrate the working of the slack adjuster; a system of double-faced signs to designate properly every device; a complete car circuit of lights to illustrate the distribution of the different lamps of each circuit.

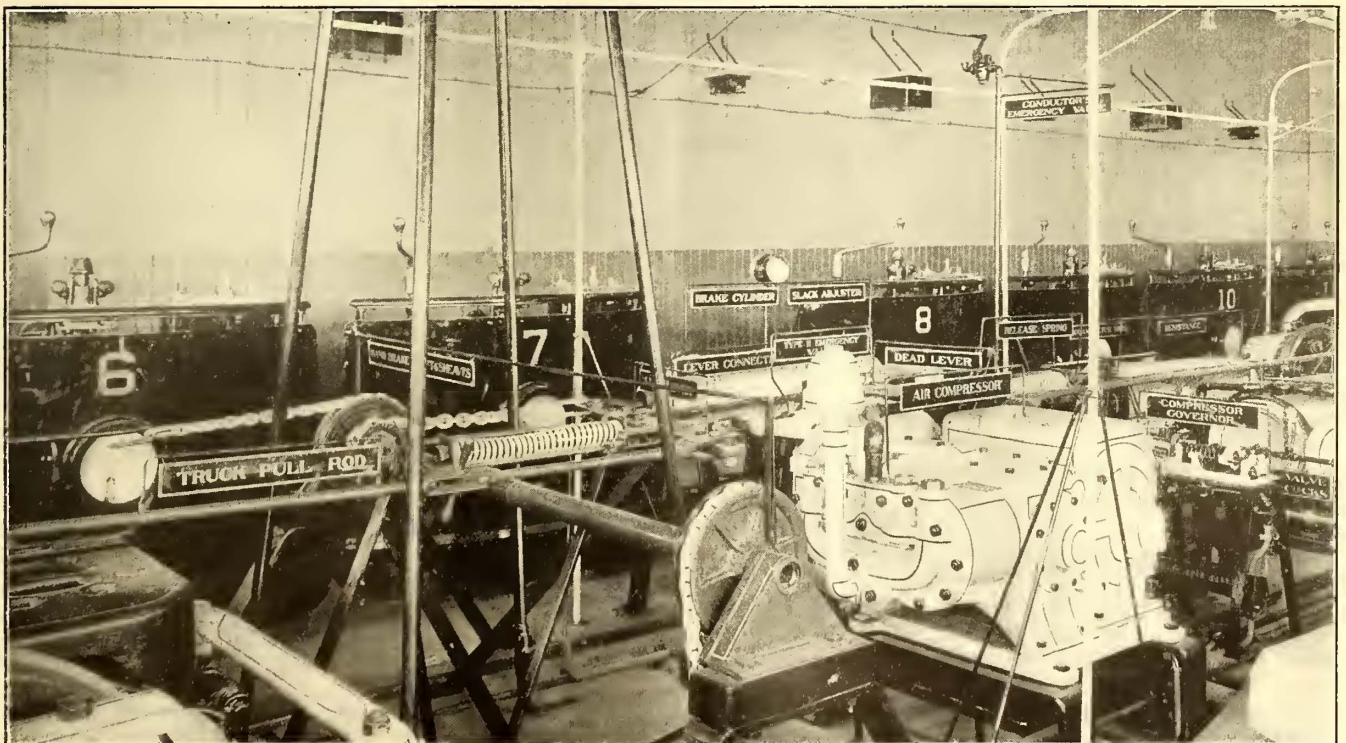
As most Brooklyn cars are equipped with semi-automatic air brakes and pneumatic sanders, instruction in their safe and economical operation receives much attention. The instructor, therefore, takes special pains to show the danger and waste inherent to excessive use of air, particularly by making needless emergency applications, as well as the proper methods in applying and releasing brakes so that smooth and efficient stops will be obtained.

INSTRUCTION IN TELEPHONING

To educate the students in the correct use of the telephone, a standard pay station with slot machine has been installed. This outfit is connected with a telephone in the outer office so that a regular conversation can be conducted. The need for instruction of this kind, even on city systems, is illustrated by instances where excited platform men have called up headquarters for a wrecker or other service but before hanging up the receiver have failed to mention the place where succor was needed.

OVERHEAD AND WAY SIGNS

To familiarize the recruits with the overhead and way signs, standard steel placards are suspended from span wires bearing such markings as the following: "Trolley Station"; "Cars Will Not Pass On This Curve"; "Section Insulator—Shut Off Power"; "Theater Stop"; "School Stop" and the arrow signs which are placed at intersections to show what lines have the right of way. The meaning of the different signs is explained to the men during their course of instruction.



BROOKLYN SURFACE CAR SCHOOL—A CLOSE VIEW OF APPARATUS ALONGSIDE DRILL STANDS SHOWING THE SYSTEM OF APPARATUS SIGNS

Another Massachusetts Fare Increase

The Public Service Commission Grants a 6-Cent Fare to the Norfolk & Bristol Street Railway—The Reason Given Is "Inadequate Return on the Stockholders' Investment"

The Massachusetts Public Service Commission issued a decision on Aug. 19 granting to the Norfolk & Bristol Street Railway authority to establish a 6-cent fare unit upon its lines, in accordance with the petition of the company addressed to the board on March 12, 1915. The present cash fare is 5 cents. The company further desired to charge 1 cent per transfer issued, but the board refused to allow this. The decision is the third of its kind within a year, the Middlesex & Boston Street Railway and the Blue Hill Street Railway being the other companies to receive fare increases according to a well-defined policy of the commission, which recognizes the importance of additional revenue in cases where the petitioner demonstrates its necessity.

The main line of the Norfolk & Bristol runs from Norwood through Walpole, South Walpole and Foxborough to Mansfield, with a branch from Foxborough to Wrentham and a shorter branch from Walpole to East Walpole. This main line substantially parallels lines of the New York, New Haven & Hartford Railroad, the total trackage covering 22.02 miles. All but 0.5 mile is in the public streets.

In brief, the company's petition asked:

1. To make the cash fare 6 cents within the limits of any fare zone.
2. To charge 1 cent for every transfer issued.
3. To sell ticket books containing fifty tickets each at \$2.75 and books of 100 tickets for \$5.50. At present there are no tickets of this kind, but on certain routes round-trip tickets are sold at 15 cents under restrictions.
4. To sell for school children, entitled by law to half-fare transportation, special ticket books containing thirty-four tickets for \$1 and strips of ten tickets for 30 cents. At present strips of ten tickets are sold for 25 cents.
5. To issue transfers on the East Walpole branch between Lake Avenue, Walpole and the Norwood town line, and vice versa, for a single fare plus the 1-cent transfer charge.
6. To establish fare limits providing for one zone on the Wrentham branch with no transfer privileges, and to eliminate the zone between the Foxborough-Walpole and the Foxborough-Mansfield town lines.

After presenting the petition, the company, in conference with citizens of the affected towns, agreed to modify the proposed schedule as follows:

In addition to the ticket books and school tickets, the company proposed to issue strips of ten tickets for 50 cents, good for one ride within any fare limit when tendered at a point which the car is scheduled to pass before 8.30 a. m., and between 5 and 7 p. m.

The company estimated that the changes proposed would, if allowed, and if no decrease in traffic resulted, produce about \$10,000 additional revenue per year. The total operating revenue for the year ending June 30, 1914, was \$93,978.

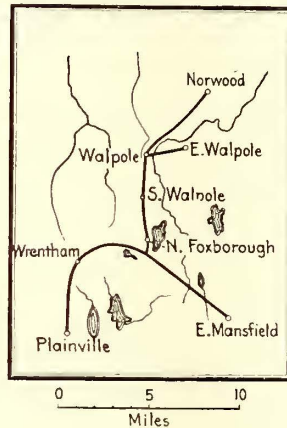
The company is the successor of the Norfolk Southern Street Railway, organized in 1897 which went into a receiver's hands in 1899, with liabilities at the time of \$493,000. The road was sold in 1901 to a syndicate including the National Shawmut Bank, Boston, and other concerns. The total investment of the syndicate was \$303,670, in March, 1902. The Norfolk & Bristol company was organized in 1901 and purchased the road from the syndicate for \$345,000. It appears that the amount of stock and debts of the new company exceeded the replacement cost of the property by \$8,000. A part of the property was also involved in the claims of other parties supplying rails and car equipment, totaling about \$21,000. In 1908 the company effected a cancellation of liabilities amounting to \$147,168 by agreement of note holders in order to float a new bond issue. Since 1904 the present management has been in charge. Up to the present there has never been a fare increase, due in part to the 5-cent fare provisions in some of the original grants of location. The population of the territory increased from 19,044 in 1900 to 28,721 in 1915, a gain of 50.8 per cent. The respective towns on the system have the following populations by the 1915 State census: Norwood, 10,970; Walpole, 5,478; Foxborough, 4,115; Mansfield, 5,765; Wrentham, 2,393. No freight or express business is conducted.

OPERATING RESULTS

Since the beginning of operation the property has had a total operating revenue, to June 30, 1915, of \$1,003,012; operating expenses, \$848,726; net operating revenue, \$154,286; miscellaneous income, \$2452; gross income less operating expenses, \$156,739, with a deficit in net divisible income of \$18,191. The only dividends paid have been two of 3 per cent in 1912 and 1913. Earnings have been falling off since 1913, the gross operating revenue then being \$96,007 against \$88,435 for 1915. The accumulated deficit is \$30,191. The total assets are \$488,714, and the company has a capital stock of \$200,000 and funded debt of \$200,000, with no outstanding notes. Since the date of the last bond issue (1909) permanent additions have been made to the extent of \$30,009, taken from surplus earnings.

The book value of the permanent property is only \$21,627 per mile, a low figure in comparison with other Massachusetts companies. The engineering department of the board estimates the cost of the property at \$449,837, or only \$24,000 less than the total permanent investments reported in the company's balance sheet. The board holds, as in the Middlesex & Boston and Blue Hill cases, that the capital honestly and prudently invested must, under normal conditions, be taken as the controlling factor in fixing the rates, and sets forth \$400,000 as the amount upon which the return should be calculated, in view of the fact that the failure of the company to make adequate provision for depreciation does not appear upon the evidence to be due to the payment of unwarranted dividends or to mismanagement.

The income record of the company from 1909 to 1915 inclusive shows a net divisible income ranging from nothing to 6 per cent on the stock and averaging 3.27 per cent over and above operating expenses and fixed charges. The commission states that "as they stand, these figures indicate an inadequate return on the stockholders' investment," but before determining the need



LINES OF NORFOLK & BRISTOL STREET RAILWAY

of additional revenue, the board considers a study of the operating expenses essential. This study shows that the company's officers have devoted part time to the management of the Norwood, Canton & Sharon Street Railway, operating 6 miles of track in adjacent territory, and the Norfolk & Bristol road rents equipment to the former at 1.5 cents per car-mile, while it actually costs the Norfolk & Bristol Street Railway at least 2.8 cents per car-mile for maintenance. Pending an agreement no bills have been rendered the Norwood, Canton & Sharon. The commission points out that the companies should reach a speedy agreement, effect a prompt settlement and adjust their relations on a definite cash basis for the future, so that the true operating expenses and income may appear. Such agreements, in the opinion of the board, should be in writing, and notice to that effect will be sent by the commission to all the operating companies in the State. Other criticisms are directed toward the company's methods of accounting, with the recommendation that an experienced bookkeeper be placed on the payroll instead of calling upon outside assistance. It is also held by the board that if the company's automobile equipment is confined to an existing runabout and a motor truck, eliminating from its expense account two touring cars garaged at the manager's residence in Boston, about \$1,750 per year can be saved. A comparison is made in the decision of the company's accounting and of the expenditures as determined by the Interstate Commerce Commission classification, adopted in 1914. Issuance of vouchers in more detail is also emphasized as desirable.

MAINTENANCE AND DEPRECIATION

An analysis of the maintenance expenses indicates that on the whole adequate provision has been made for this purpose. Until 1915 the company had accumulated no depreciation reserve, as such, when \$2,167 was so charged. The board points out that the rough rule of allowing 20 per cent of operating revenue to cover maintenance and depreciation is particularly questionable when applied to a small road with relatively low gross earnings. The commission finds that despite the fact that the company, out of its total net earnings has paid only \$6,000 in dividends to its stockholders and has apparently turned back more than \$30,000 into the property, it appears that the property may have depreciated in value to the amount of nearly \$110,000 as compared with the investment of \$400,000. Says the board: "The accumulation of a depreciation reserve or surplus fund equal to the entire amount of the estimated depreciation is perhaps more than good business policy necessarily requires; but the evidence demonstrates, we think, that while the Norfolk & Bristol has made some provision for depreciation, it has not made due provision."

NEED OF INCREASED REVENUE DEMONSTRATED

The inspection department of the board estimates about \$14,000 as the average expenditure which should henceforth be made each year for several years in order to maintain tracks and overhead structures in a safe and proper condition, and about \$11,000 for maintenance and depreciation of equipment. It appears that for the past two years, if the company had expended \$25,000 a year for maintenance and depreciation, it would have shown a deficit during that period of \$2,263. In order to make up this deficiency and to permit of a 6 per cent return to its stockholders, says the decision, the company must show an increase of more than \$13,000 over its average net earnings for the past two years. With the possible economies in operation indicated the company would appear on this basis to be entitled to an additional revenue of something more than \$10,000 a

year. The evidence does not indicate that the return to the stockholders, allowing for depreciation and an accumulation of proper surplus funds, would have been adequate if earnings had been more nearly normal, considering the effect of the financial depression. With a steady increase in population in the territory served and improving business conditions and with economies in operation or management it is possible, the board holds, that the company could in future earn an adequate return without an increase in rates; but the commission upon the evidence states that it would not feel justified in refusing an increase because of such speculations. The opportunity to reduce rates at any time if earnings prove excessive is always open. Upon the evidence, therefore, the commission finds that the need of additional earnings has been demonstrated.

EFFECT OF 6-CENT FARE ON TRAFFIC

The company's estimate of about \$10,000 increased revenue from the proposed changes in fare and zones, transfer charge and tickets, is based on the fares collected in 1914, and is made up on the assumption that the changes will not produce a decrease in traffic. The board calls attention to evidence that this assumption is likely to prove incorrect by the following table of revenue passengers carried by seven Massachusetts electric railways in the year before and in the year after the change was made:

Company	Revenue Passengers Carried	
	Before 6-cent Fare	After 6-cent Fare
Blue Hill	1,680,543	1,525,154
Boston & Worcester	11,143,040	10,481,902
Brockton & Plymouth	2,255,320	1,856,723
Concord, Maynard & Hudson	1,146,088	969,621 ¹
Connecticut Valley	3,714,765	3,357,857 ²
Lexington & Boston	2,766,618	2,638,114
Newton & Boston	1,402,385	1,313,947

¹ Five months at 5 cents, seven months at 6 cents.

² Three months at 5 cents, nine months at 6 cents.

While there may have been other contributing causes in certain cases, the table supports the theory that a 6-cent fare decreases traffic. The board considers that the company's estimates are on the whole reasonable. These assume that 40 per cent of the passengers will use the workmen's tickets in the morning and evening, and that 25 per cent of the remainder will use the 5.5-cent tickets.

APPROVAL OF INCREASED FARE

So far as the essential features of the petition are concerned, except with regard to a transfer charge, the board approves the proposed new schedule. Transfers are not to be issued at an additional charge, the board holds, because the total length of ride which can be secured with the use of a transfer is no longer than can be secured on other parts of the system, where cars are routed through.

Relative to the sale of tickets, the commission holds that the company should issue books containing eighteen tickets for \$1, so that regular patrons may have the opportunity, upon payment of a comparatively small sum, to secure transportation at a somewhat lower cost than the transient rider. The use of ticket books containing fifty rides for \$2.75 is also permissible. The board approves the reduction in the number of fare zones on Wrentham branch from two to one, with the abolition of the present transfer privilege between the Mansfield-Foxborough and the Foxborough-Walpole town lines, the company holding the view that the distance is not long enough to justify a two-fare zone at 6 cents. In the board's opinion, the necessity for the other changes in zones and transfer facilities is not demonstrated. The decision is to take effect within thirty days.

Cleveland Builds Four Operating Stations

Attractive Trainmen's Quarters, Commodious Running Repair Shops and Loop Storage Yards Are the Principal Features of These \$225,000 Layouts, of Which the Superior Avenue Station Is Described

In its operating station rehabilitation the Cleveland (Ohio) Railway has adopted loop-yard tracks and outside car storage in preference to inside car storage. The loop-yard tracks are a unique feature and have been found very advantageous from an operating standpoint. The shops for making running repairs at these stations are more extensive than those usually installed at such points, and greater attention than usual has been paid to the architectural appearance of these stations, as most of them are in residential districts. Finally, a great many conveniences for the trainmen were included in these buildings, and their interiors resemble in arrangement and pleasing appearance the rooms of a private club.

REASONS FOR PRINCIPAL FEATURES

Attractiveness, because the buildings were erected in residence districts, and permanency, because that class of construction has been found most economical, were the fundamental features which governed the design. Locations in residential districts or on property certain to develop into them, were selected because they would afford homes for the trainmen near at hand. In addition, dwellings are quite certain to spring up near the end of a line, the best location for a carhouse, and in the end contribute to the patronage of the service. Outside storage was adopted because the management believed that the interest on the unit price of inside storage would more than care for the reduction in paint life and other supposed disadvantages of this method of storing cars. The management also felt that since cars were on the streets practically eighteen hours each day, it was not essential to house them for the six remaining hours, particularly when land for yards could be purchased at a reasonable price. The attractive quarters for the trainmen conform to the policy of this company.

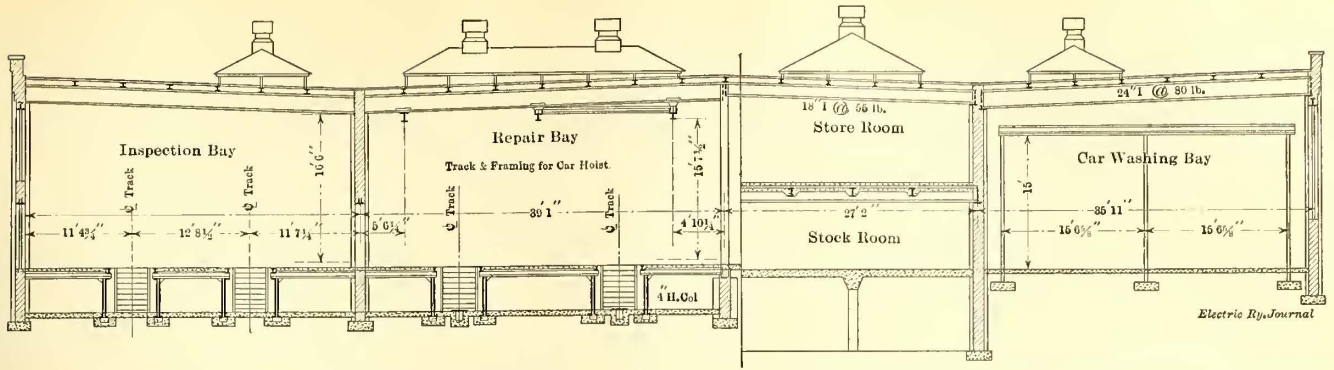
Four operating stations similar in design to the Superior Avenue station will be constructed before rehabili-

tation is complete. The St. Claire Avenue station was completed about two years ago. The Superior Avenue station has just been finished, and similar stations at Harvard Avenue and Fifty-fifth Street, and at Denison Avenue and Seventy-third Street will be constructed in the near future. Each outside loop storage yard is designed to store 193 cars, but sufficient area has been included in each property so that this capacity can be materially increased. In general, the loop storage yards occupy the rear of the property, with the operating station and the running repair shop near the track entrances. The loop storage yard arrangement provides entrance at one side of the yard and exit at the other, and the car movement in the yard is always in one direction. The general layout of the Superior Avenue station is shown in one of the accompanying illustrations.

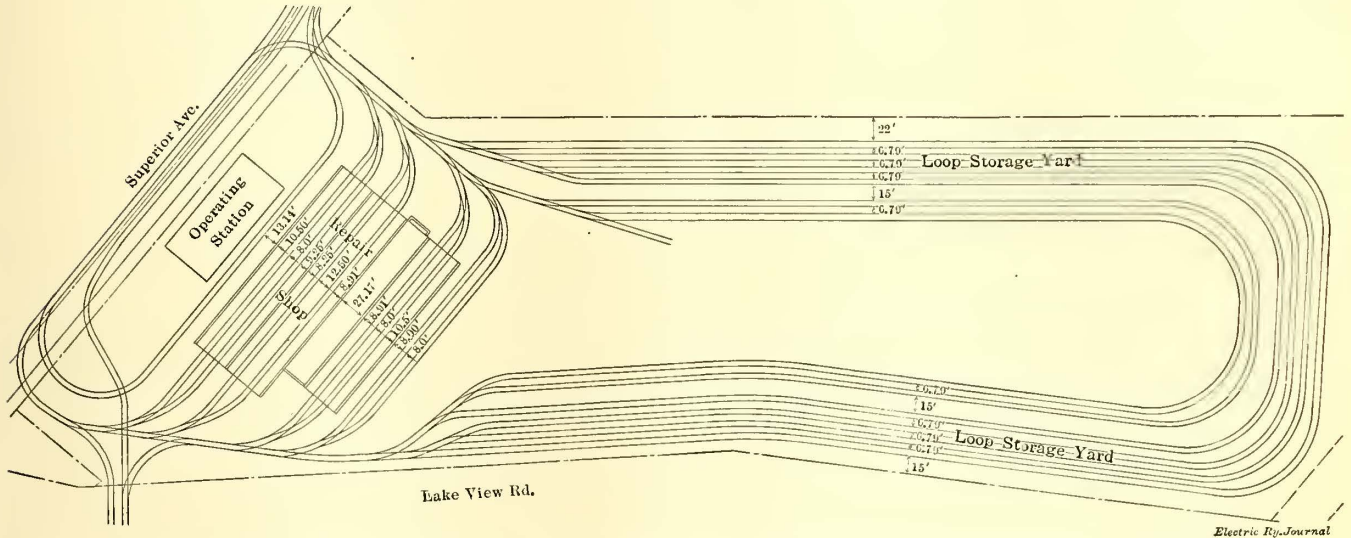
It is of particular interest to note that expert knowledge of real estate values was employed when the sites for these new operating stations were purchased, as well as when the old ones were sold. While the business of the company is primarily that of railway operation, it has made it a policy to endeavor to collect profits from other sources. This has been particularly true of past real estate purchases for carhouses and shops, which at the present time have greatly enhanced values. The site purchased for the Superior Avenue station included 10 acres in what was originally a gully of little real estate value. At the time of the purchase, however, the company had in mind disposing of the waste track excavation and, in time, filling the gully to the level of the surrounding property. This has been accomplished during the last few years, and, because of the improved condition, the rapidly enhanced real estate values in the surrounding property has netted a handsome return to the company. In fact, it has received offers for small parts of this property which would much more than reimburse it for the original price paid for the entire tract. At the same time the location is central for the



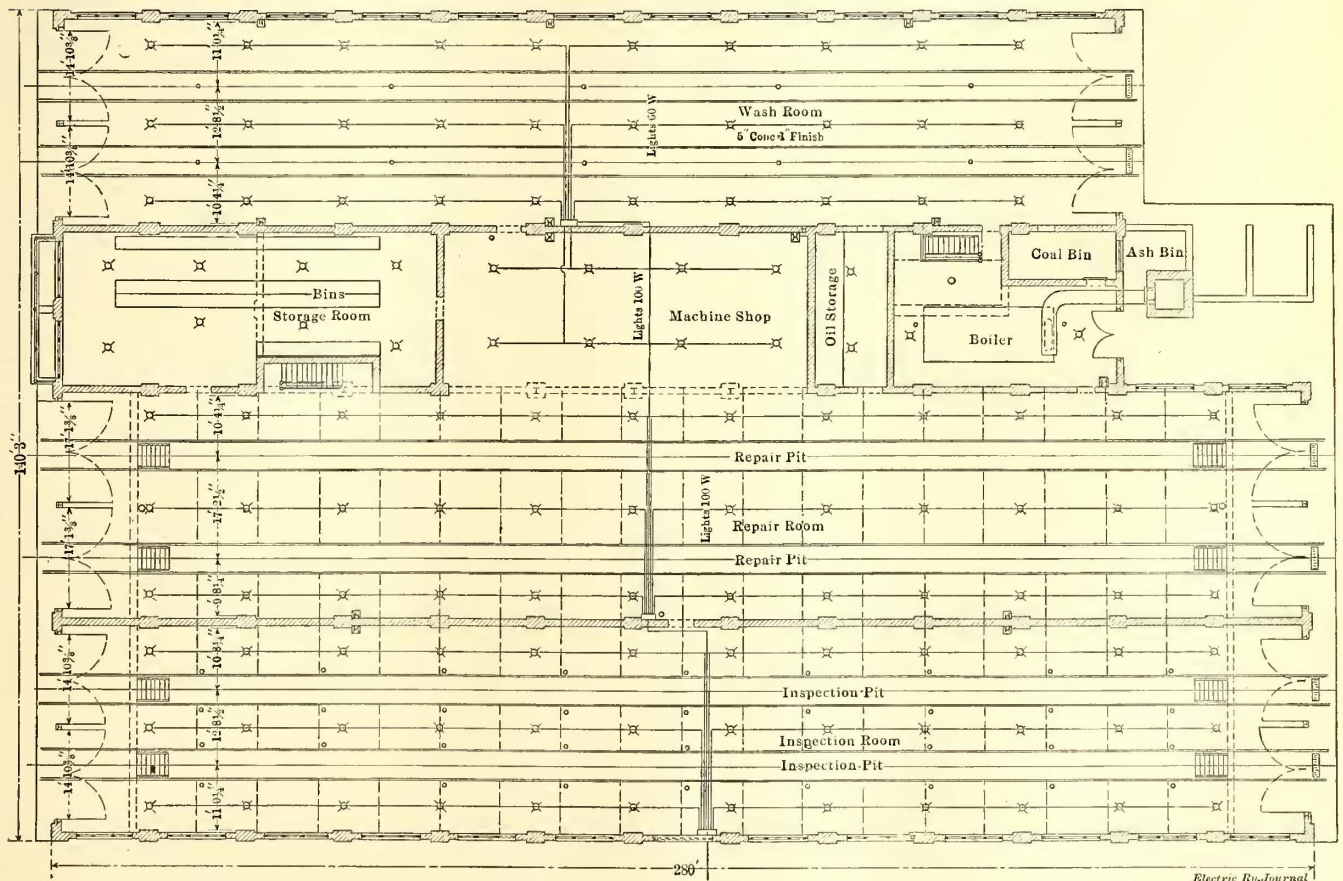
CLEVELAND OPERATING STATIONS—FRONT VIEW OF SUPERIOR AVENUE STATION BUILDING



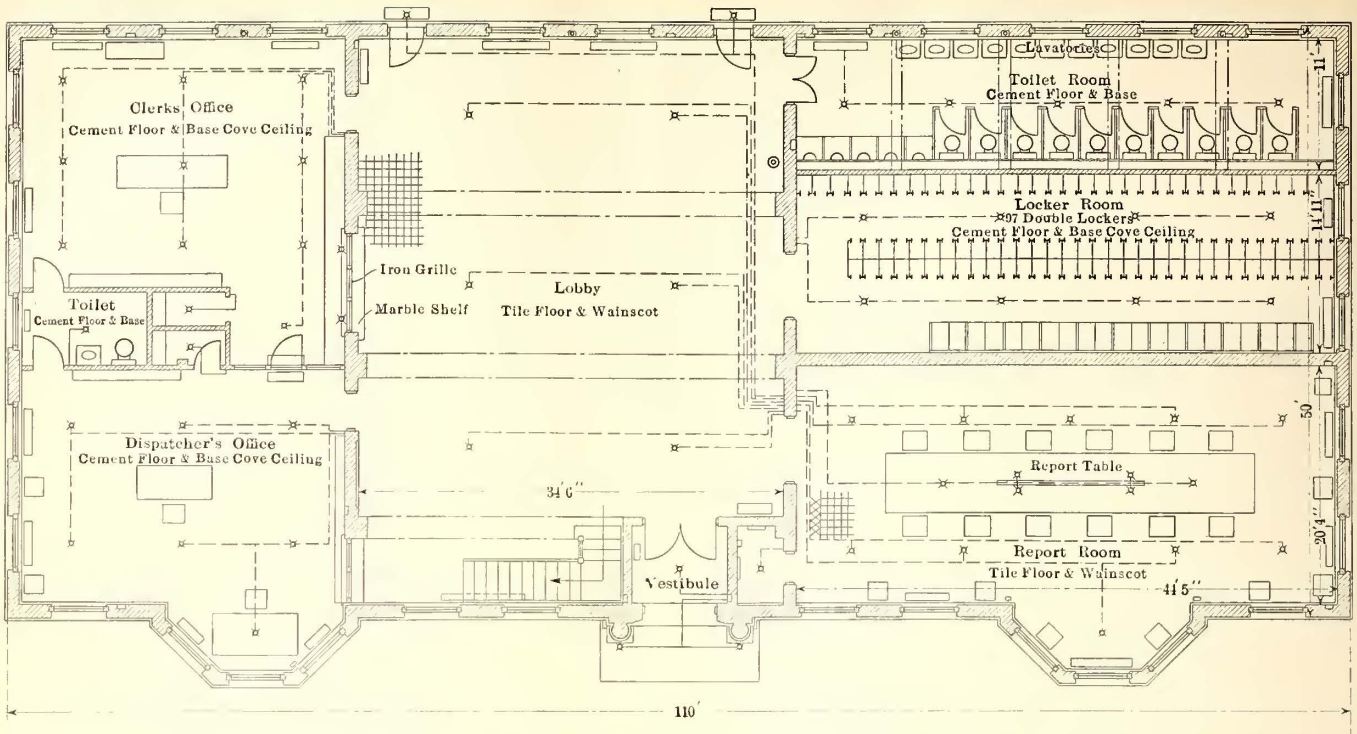
CLEVELAND OPERATING STATIONS—CROSS-SECTION OF REPAIR AND INSPECTION SHOP BUILDING



CLEVELAND OPERATING STATIONS—GENERAL LAYOUT SUPERIOR AVENUE YARD AND BUILDINGS



CLEVELAND OPERATING STATIONS—PLAN OF REPAIR AND INSPECTION SHOP BUILDING



CLEVELAND OPERATING STATIONS—FIRST-FLOOR PLAN OF SUPERIOR AVENUE STATION

track department, consequently an economical point from which to dispose of waste excavated material. The company believes that the cost of improving the property has been more than made up in the savings to the track department.

GENERAL LAYOUT

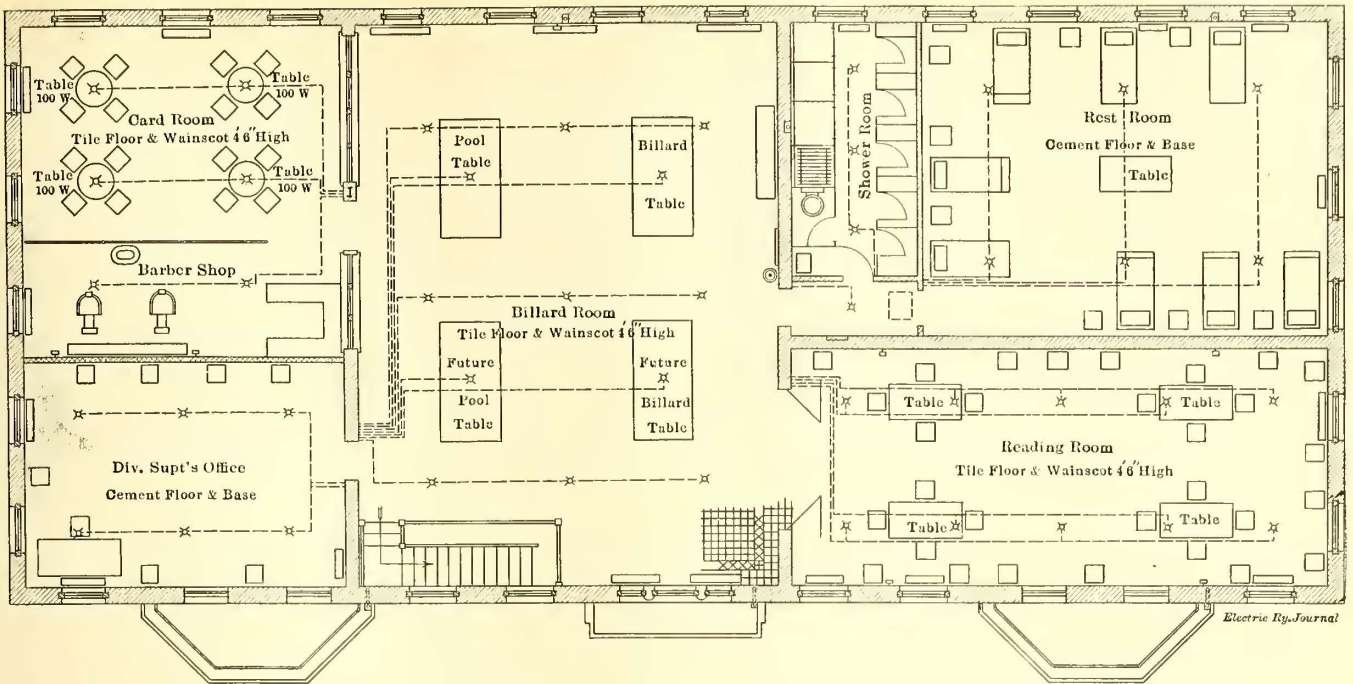
The Superior Avenue operating station occupies a tract of land approximately 300 ft. wide by 1500 ft. deep. Wye-track entrances lead in from Superior Avenue on each side of the property and form ladders for the tracks leading into the running repair-shop bays. From these the entrance tracks connect to the six loop storage tracks which occupy the rear of the property. Cars enter the yard from the corner of Indiana and Superior Avenues and leave by the tracks at the oppo-

site side of the property. A small loop passes around the operating station building at the front of the property and serves to turn the Superior Avenue cars in regular service, this being the end of the line.

The operating station is a two-story structure, 50 ft. x 110 ft. in plan, and the repair shop is a one-story building, 140 ft. 3 in. x 208 ft. in plan, with a partial second floor and basement. The floor plans of both of these buildings are shown in the accompanying illustrations. The station is a thoroughly fireproof, brick, concrete and steel structure in which there is no exposed steel other than the stairway, windows, doors and furniture. The shop building is also a brick, concrete and steel structure, but the beams and columns supporting the roof are exposed. A complete sprinkler system is installed in the shop, however, and this protective feature



CLEVELAND OPERATING STATIONS—GENERAL VIEW OF TRACK ENTRANCES TO SHOPS AND YARD



CLEVELAND OPERATING STATIONS—SECOND-FLOOR PLAN OF SUPERIOR AVENUE STATION

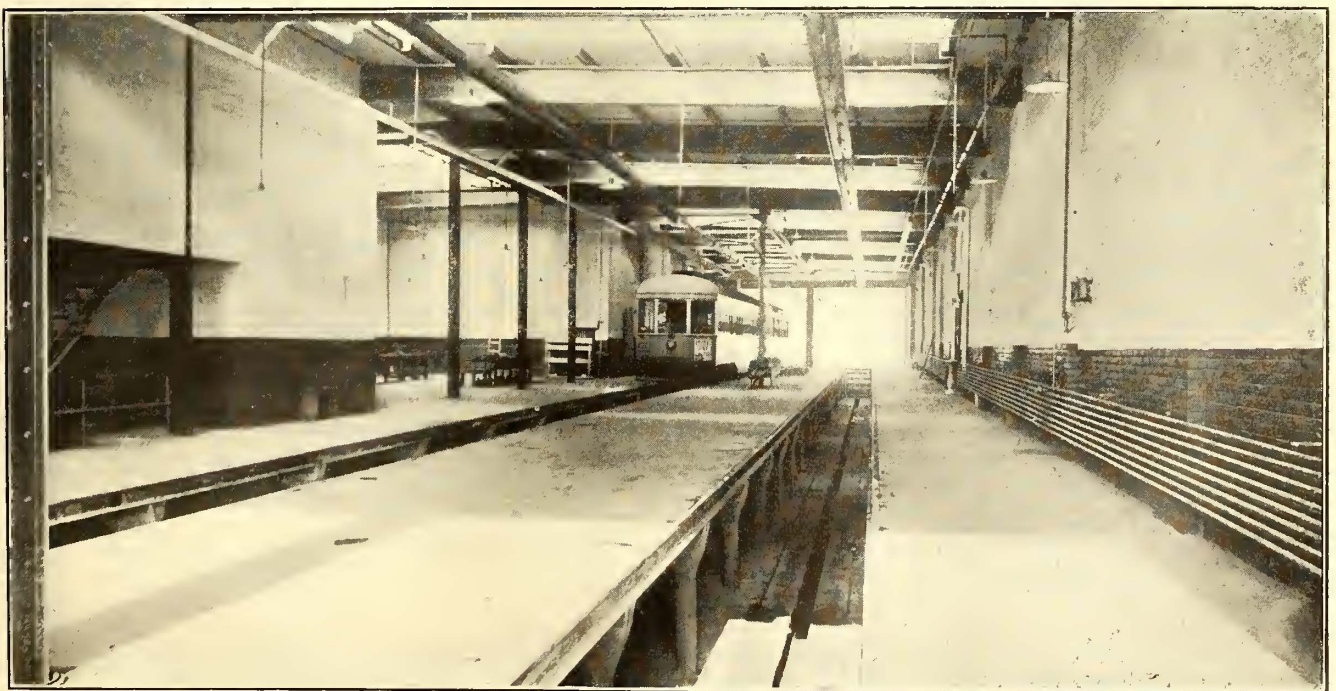
makes this a building upon which the minimum insurance rate was obtained.

Aside from the two large buildings there are a pump house and a concrete water storage well, both used in connection with the monitor fire-protection system in the open storage yard. The pump is electrically operated and automatically controlled, and has a capacity of 1000 gal. per minute at 125-lb. pressure. The grounds surrounding the operating station have been parked, while the track entrances flanking this area have been paved level with the top of rails with limestone screenings. The overhead construction was carefully planned to obtain permanency with the minimum number of poles. Tubular steel poles and span-wire construction were used throughout the layout. The tracks are laid with standard A.S.C.E. 80-lb. rail and man-

ganese center special work. The yard is lighted with 500-watt Mazda lamps suspended at 60-ft. intervals from the span wires. Reinforced-concrete trash bins between and beside the yard tracks were also provided at convenient intervals so that it would be unnecessary to litter the yards when cars were cleaned.

OPERATING STATION DETAILS

Essentially the operating station was planned as a division headquarters and includes dispatcher's, cashier's and division superintendent's offices. The portion of the building occupied by these, however, is small as compared with that devoted to the convenience and welfare of trainmen. The cashier's and dispatcher's offices are in one end of the first floor of this structure, while the remaining portion is divided into a handsomely-



CLEVELAND OPERATING STATIONS—REPAIR-SHOP BAY SHOWING CHARACTER OF CONSTRUCTION



CLEVELAND OPERATING STATIONS—VIEW OF BILLIARD ROOM ON SECOND FLOOR



CLEVELAND OPERATING STATIONS—VIEW OF SCHEDULE ROOM WITH METAL FURNITURE

furnished tile floor lobby, from which entrances lead into large toilet and locker rooms and a trainmen's schedule room. The space on the second floor is devoted to club rooms, with one corner serving as the superintendent's office. On this floor are card room, barber shop, billiard room, rest room, reading room and shower baths. Some of the more important rooms are shown in the accompanying illustrations. They are attractively finished in every detail and furnished with artistic all-metal furniture. The floors and wainscoting are of red square tile laid with black mortar. The lighting scheme is of both the direct and the semi-indirect types. A complete outfit of lockers for both the operating station and the repair shop was furnished by Merritt & Company of Camden, N. J. The metal furniture was purchased from the Art Metal Construction Company of Jamestown, N. Y.

In connection with the operating side of this station it is interesting to note that the cashier, in addition to handling the trainmen's supplies and turn-ins, also acts as a clerk to the dispatcher. The dispatcher, in turn, is the car-mileage accountant who keeps a careful record of the mileage made by each of the cars operating out of his station. This is a very important duty because under its contract with the city the earnings of the Cleveland Railway are based upon the car-miles run. This station operates regularly 101 cars, consisting of fifty-eight motor cars and forty-three trailers.



CLEVELAND OPERATING STATIONS—VIEW IN STATION LOCKER ROOM

In round numbers 200 trainmen work out of this station, and the club-room features are under their control. Certain nominal charges are made, and these are collected by the barber, who also cares for the club rooms. This money is turned over to the dispatcher who, in all cases, is the treasurer of the club and under a \$500 bond. Each club has a president and secretary elected to office, but it was deemed advisable that the dispatcher should be treasurer. A charge of 5 cents a night is made for the use of the cots in the rest room, there being fourteen in all. The barber is paid \$18 a week for his services in caring for the club rooms, showers and beds. He usually runs a small stand where cigars and candies may be had. With this and his barber work, he earns some money in addition to his weekly wage. A charge of 1 cent a cue is made for the use of the billiard tables, and a record of the collections for this is kept on a register. The company furnishes the billiard tables and twenty-four cues, and the employees keep them in repair.

RUNNING REPAIR SHOP

This building is divided into three bays, one serving for inspection purposes, another for running repairs and the third for car washing. Occupying a portion of the repair bay is a stock room where the repair parts are under the supervision of a clerk. A machine shop, an oil room and a boiler room containing the heating plant of the shop building and the operating station also occupy space in this bay. The repair shop of this station was made somewhat larger than those contemplated for the other stations, as it was intended to be a branch of the general repair shop. Light repairs to cars from the other operating stations will be made.

Included in the repair-shop equipment are one No. 2 Bridgeport wet and dry grinder, one 20-in. 8-ft. engine lathe, one 20-in. vertical drilling machine, one power-driven hack saw, one 26-in. power-driven hand saw, a forge and an anvil. Facilities for handling repair parts include a pit jack for motors, three 12-in. air hoists employed in lifting car bodies and removing trucks, two revolving jib cranes, one at each end of the shop, used in general movement of materials, and a motor-driven air compressor installed in the basement to supply air to the pneumatic hand tools and air hoists. A complete oil pump and tank equipment furnished by the Milwaukee Tank Works was installed in the oil room.

Both the repair and inspection bays are built with concrete floors and pits extending the full length of the bay under each track. These pits are constructed

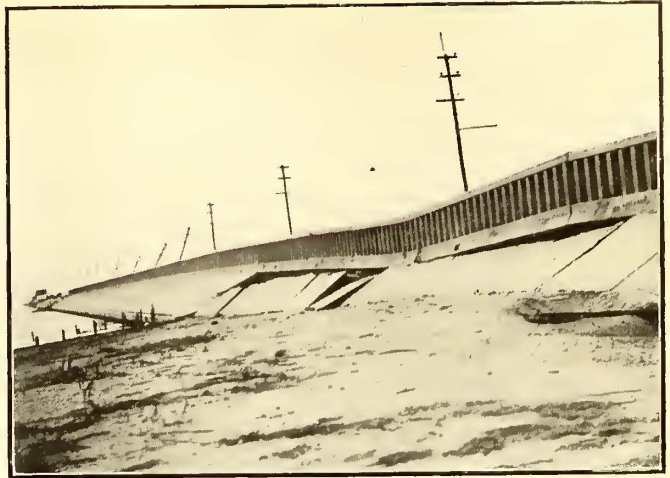
with 7-in. plain girder rails spanning the interval between 4-in. H-column supports. The tracks in the inspection bay are on 17-ft. 2½-in. centers, a spacing which provides liberal aisles along the walls between the tracks.

All tracks in the repair shop are through tracks, entering each bay through openings equipped with double wooden swinging doors. A liberal number of Drouvé skylights equipped with Swartout ventilators furnish a uniform natural illumination. Artificial illumination is supplied by 60-watt tungsten lamps suspended on drop cords. The trolley wire is made continuous through the bays and the usual wooden trolley-trough construction is used. Heat in the repair shop is furnished through pipe coils mounted on racks, while in the operating station there are ornamental cast-iron radiators. Steam is supplied from the central boiler in the repair shop, and the system is of the vacuum type with Dunham vacuum traps for each radiator.

The partial second floor in the repair shop bay over the storeroom is given over to locker and toilet rooms for the shop employees. A portion of the second floor, however, is used for storing the Peter Smith Heater Company's hot-air heaters during the summer months. This storeroom opens into the car washing bay, where a hoist is provided to raise the heaters to the storeroom.

In connection with the washing and cleaning system it is interesting to note that the outsides of all cars are washed every three or four days and the cars are thoroughly washed on the inside every two months. Of course, the usual sweeping and dusting done each night is also a general practice. In connection with the regular method of cleaning, however, two types of vacuum cleaners are being installed for test at this station. Both of these cleaners are of a stationary type, one being furnished by the Spencer Turbine Cleaner Company, Hartford, Conn., and the other by the United Electric Company, Canton, Ohio. If these installations prove satisfactory it is contemplated that the vacuum method of cleaning cars will be extended to include all the stations on the system.

The several departments interested in this operating station installation supervised the design and construction work. Terence Scullin, master mechanic, was in charge of the shop layout; C. H. Clark, engineer maintenance of way, was in charge of track construction; L. P. Creelius, electrical engineer, was in charge of the electrical layout, all work being under the general direction of J. J. Stanley, president. The building design and construction work, however, were under the supervision of David W. Morrow, of the firm of Morrow & Cross, civil and architectural engineers.



TEXAS HURRICANE—100-FT. BREAK NEAR ISLAND END OF GALVESTON CAUSEWAY APPROACH

Texas Hurricane Damage

The coast of Texas was swept on Aug. 16 by a tropical hurricane, considered the most severe in the history of Gulf storms. A gale which at times reached a velocity of 90 miles, took a heavy toll of lives and wrought property damage which it is impossible accurately to estimate. The storm centered at Galveston, but much damage was reported as far north as the central part of the State. Interurban and city railway service was demoralized along the coast.

About two o'clock on the afternoon of Aug. 16 an interurban car loaded with passengers attempted to leave the island for Houston. The car proceeded nearly to the lift bridge in the center of the causeway over Galveston Bay when a section crumbled and 2000 ft. was swept away by the current. The car rolled to one side, but remained partially in the breach. Most of the passengers escaped without injury. A single-track trestle over Galveston Bay is being discussed by railroad and traction men, as it would not take as long to build the trestle as to repair the causeway.

The city of Houston fared little better than Galveston as to wires and poles. In Waco all street cars were rerouted to avoid passing a seventeen-story building around which the storm seemed to converge.

The Southwestern Traction Company, operating between Belton and Temple, suffered only from trouble caused by wind. The entire damage to all the traction interests, excluding loss of revenues, is unofficially estimated at \$700,000.



TEXAS HURRICANE—VIEW OF THE GALVESTON CAUSEWAY, SHOWING WRECKED INTERURBAN CAR

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 to 8, 1915

American Association News

ANNUAL CONVENTION
SAN FRANCISCO
OCTOBER 4 TO 8, 1915

Convention Program Includes Addresses by Governor H. W. Johnson, Ex-Senator Jonathan Bourne, Jr., Bion J. Arnold, Jesse W. Lilienthal, Paul Shoup, Prof. H. R. Hatfield, Prof. Carl C. Plehn and Messrs. Winslow and Teesdale, of the U. S. Forest Products Laboratory

PROGRAM FOR THE CONVENTION

The following program has just been announced by Secretary E. B. Burritt. It is still subject to revision.

PROGRAM OF AMERICAN ASSOCIATION

Monday, Oct. 4

9.30 a. m. to 5 p. m.

Registration and distribution of badges at booth, lobby of Native Sons of the Golden West Building.

Tuesday, Oct. 5

9.30 a. m. to 12.30 p. m.

Address of welcome, by Hon. Hiram W. Johnson, Governor of California.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations,
- (c) Recommendations contained in president's address.

Reports of committees:

- (a) Subjects,
- (b) Education,
- (c) Representing association at the American Good Roads Congress,
- (d) Valuation,
- (e) National joint committee on overhead and underground line construction.

Address on "Welfare Work," by Jesse W. Lilienthal, president United Railroads of San Francisco, San Francisco, Cal.

General discussion.

Reports of committees (continued):

- (f) Company membership,
- (g) Company section medal,
- (h) Federal relations,
- (i) Anthony N. Brady medal,
- (j) Compensation for carrying United States mail.

Wednesday, Oct. 6

9.30 a. m. to 12.30 p. m.

Reports of committees:

- (a) Electrolysis,
- (b) Ways and means,
- (c) Company sections and individual membership,
- (d) Dues of company section members,
- (e) Changes in constitution and by-laws,
- (f) Relations with State and sectional associations,
- (g) Public relations.

Address on "Government Ownership," by Ex-United States Senator Jonathan Bourne, Jr.

General discussion.

Reports of committees (continued):

- (h) Operation of motor vehicles,
- (i) Aera advisory,
- (j) Insurance,
- (k) Standards for car loading.

Thursday, Oct. 7

9.30 a. m. to 12.30 p. m.

Reports of committee:

- (a) Cost of passenger transportation service, including report of Bureau of Fare Research.

Address on "The Foundation Principles of the Valuation of Electric Railways," by Bion J. Arnold, chair-

man Board of Supervising Engineers, Chicago Traction, Chicago, Ill.

General discussion.

Reports of committees (continued):

- (b) Taxation matters,
- (c) On recommendations contained in the president's address,
- (d) Resolutions,
- (e) Nominations.

Unfinished business.

Election of officers.

Installation of officers.

Adjournment.

Friday, Oct. 8

3 p. m., Exposition Grounds

Presentation of testimonial from the Panama-Pacific Exposition Company, commemorative of the 1915 meeting, by exposition officials.

(Particulars to be announced.)

PROGRAM OF ACCOUNTANTS' ASSOCIATION

Monday, Oct. 4

9.30 a. m. to 5 p. m.

Registration and distribution of badges at booth, lobby of Native Sons of the Golden West Building.

Monday, Oct. 4

2 p. m. to 4.30 p. m.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Standard classification of accounts,
- (b) Accounting definitions,
- (c) Representing association at convention of railroad commissioners,
- (d) Education,
- (e) Freight and express accounting,
- (f) Passenger accounting,
- (g) Joint report, passenger and freight and express accounting.

4.30 p. m. to 5 p. m.

Joint session with Transportation & Traffic Association

Report of committee:

- (a) Transportation-accounting.

Tuesday, Oct. 5

2 p. m. to 4 p. m.

Address (topic to be announced), by Prof. H. R. Hatfield, University of Chicago.

Paper on "The Merits of Prepayment Cars from the Viewpoint of the Accounting Department," by R. J. Clark, comptroller Metropolitan Street Railway, Kansas City, Mo.

4 p. m. to 5 p. m.

Joint session with Claims Association

Report of committee:

- (a) Claims-accounting.

Wednesday, Oct. 6

2 p. m. to 3 p. m.

Joint session with Engineering Association

Reports of committees:

- (a) Engineering-accounting,
- (b) Life of railway physical property.

3 p. m. to 5 p. m.

Changes in constitution and by-laws.

Address on "Treatment of Charges for Rent of Tracks and Facilities and Rent of Equipment," by Paul Shoup, president Pacific Electric Railway, Los Angeles, Cal.

Address on topic to be announced, by Prof. Carl C. Plehn, University of California.

Reports of convention committees:

- (a) Resolutions,
- (b) Nominations.

Election of officers.

Installation of officers.

Adjournment.

Friday, Oct. 8

See program of American Association.

PROGRAM OF ENGINEERING ASSOCIATION

Monday, Oct. 4

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, lobby of Native Sons of the Golden West Building.

2 p. m. to 5 p. m.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committee:

- (a) Resolutions.

Reports of committees:

- (a) Lightning protection,
- (b) Standards,
- (c) Power distribution,
- (d) Standards (on recommendations contained in above report).

Tuesday, Oct. 5

2 p. m. to 3 p. m., joint session with Transportation & Traffic Association.

Reports of committees:

- (a) Block signals for electric railways,
- (b) Standards (on recommendations contained in above report),
- (c) Joint sub-committee on block signal rules,
- (d) Transportation-engineering.

3 p. m. to 5 p. m.

Reports of committees:

- (a) Equipment,
- (b) Standards (on recommendations contained in above report),
- (c) Buildings and structures,
- (d) Standards (on recommendations contained in above report).

Wednesday, Oct. 6

2 p. m. to 3 p. m., joint session with Accountants' Association.

Reports of committees:

- (a) Engineering-accounting,
- (b) Life of railway physical property.

3 p. m. to 5 p. m.

Reports of committees:

- (a) Constitution and by-laws,
- (b) Power generation,
- (c) Standards (on recommendations contained in above report),

Thursday, Oct. 7

2 p. m. to 5 p. m.

Reports of committees:

- (a) Way matters,
- (b) Standards (on recommendations contained in above report).

Paper on "Some Factors Affecting the Application of

Wood Preservation to Electric Railways," by Messrs. Winslow and Teesdale of the Forest Products Laboratory, United States Department of Agriculture, Madison, Wis.

Reports of committees:

- (c) Heavy electric traction,
- (d) Standards (on recommendations contained in above report),
- (e) Electrolysis.

General Business.

Report of convention committee:

- (a) Resolutions,

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

Friday, Oct. 8

See program of American Association.

PROGRAM OF CLAIMS ASSOCIATION

Monday, Oct. 4

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, lobby of Native Sons of the Golden West Building.

2 p. m. to 5 p. m.

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Accident prevention board,
- (b) Employment,
- (c) Ways and means.

Paper on "Automobiles," by S. B. Hare, claim agent Altoona & Logan Valley Electric Railway, Altoona, Pa.

Written discussion.

Tuesday, Oct. 5

2 p. m. to 4 p. m.

Paper on "Standardization of Claims Statistics," by E. E. Slick, claim adjuster Union Traction Company of Indiana, Anderson, Ind.

Written discussion.

4 p. m. to 5 p. m., joint meeting with Accountants' Association.

Report of committee:

- (a) Claims-accounting.

Wednesday, Oct. 6

2 p. m. to 3 p. m., joint session with Transportation & Traffic Association.

Report of committee:

- (a) Claims-transportation.

3 p. m. to 5 p. m.

Changes in constitution and by-laws.

Paper on "A Card Index and What It Means," by J. J. Reynolds, claims attorney Boston Elevated Railway, Boston, Mass.

Written discussion.

Thursday, Oct. 7

2 p. m. to 5 p. m.

Paper on "Safety and Its Relation to Conservation," by B. F. Boynton, claim agent Portland Railway, Light & Power Company, Portland, Ore.

Written discussion.

General business.

Reports of convention committees:

- (a) Resolutions,
- (b) Nominations.

Election of officers.

Installation of officers.
Adjournment.

Friday, Oct. 8

See program of American Association.

PROGRAM OF TRANSPORTATION & TRAFFIC ASSOCIATION
Monday, Oct. 4

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, lobby
of Native Sons of the Golden West Building.

2 p. m. to 4.30 p. m.

Annual address of the president.
Annual report of the executive committee.
Annual report of the secretary-treasurer.
Appointment of convention committees:

- (a) Resolutions,
- (b) Nominations.

Reports of committees:

- (a) Rules,
- (b) Construction of schedules and time-tables,
- (c) Definitions.

4.30 p. m. to 5 p. m., joint session with Accountants'
Association.

Report of committee:

- (a) Transportation-accounting.
Tuesday, Oct. 5

2 p. m. to 3 p. m., joint meeting with Engineering Asso-
ciation.

Reports of committees:

- (a) Block signals for electric railways,
- (b) Standards (on recommendations contained in
above report),
- (c) Joint sub-committee on block signal rules,
- (d) Transportation-engineering.
3 p. m. to 5 p. m.

Report of committee:

- (a) Standards.

Paper on "Relation of Electric Railways to Agriculture,"
by Paul Shoup, president Pacific Electric Railway
Company, Los Angeles, Cal.

Wednesday, Oct. 6

2 p. m. to 3 p. m., joint session with Claims Association.

Report of committee:

- (a) Claims-transportation.
3 p. m. to 5 p. m.

Changes in constitution and by-laws.

Reports of committees:

- (a) Freight and express traffic,
- (b) Passenger traffic.

Thursday, Oct. 7

2 p. m. to 5 p. m.

Reports of committees:

- (a) Fares and transfers,
- (b) Training of transportation employees.

General business.

Reports of convention committees:

- (a) Resolutions,
- (b) Nominations.

Election of officers.

Installation of officers.

Adjournment.

Friday, Oct. 8

See program of American Association.

AMERICAN ASSOCIATION LOCAL CONVENTION
TRANSPORTATION COMMITTEE

President C. Loomis Allen has appointed the follow-
ing Pacific Coast railway men as a local transportation
committee to co-operate with the corresponding Manu-
facturers' Association committee of which A. G. Jones,
General Electric Company, San Francisco, is chairman;
Henry T. Jones, general superintendent United Rail-
roads of San Francisco, chairman; J. H. Handlon,

claim agent of the same company, and George H. Har-
ris, general superintendent San Francisco-Oakland
Terminal Railways, Oakland, Cal. The names of the
members of the Manufacturers' Association committee
were printed on page 319 of the issue of the ELECTRIC
RAILWAY JOURNAL for Aug. 21.

COMMUNICATION

Dangers of the Jitney

GARFORD MOTOR TRUCK COMPANY

LIMA, OHIO, Aug. 18, 1915.

To the Editors:

So long as the jitney movement is confined largely to
the second-hand motor car or prompted from a deter-
mination to get even with the public service corpora-
tions, there cannot be much assurance of permanence.
The feeling of being imposed upon and a spirit of re-
venge may induce a part of the public to endure hard-
ships, exposure and risks in cheap, poorly-constructed
and wornout equipment, but before long the same peo-
ple will become dissatisfied with such service and will
no longer be willing to be pushed around in crowds
while waiting on sidewalks for the privilege of riding
home in a motor car.

The progress of motor-bus transportation, whether
in the hands of public service corporations or in the
hands of private individuals and known as the jitney,
depends upon the following among other conditions:

1. Regularity and dependability of service.
2. Improvement of street conditions in the average
city to insure the lowest cost of maintenance; other-
wise, the cost will be excessive.
3. Selection of equipment from careful study of re-
quirements in order to insure comfort and safety equal
to that offered by the competitive service.

We hold public service corporations responsible for
the safety of their passengers, and why should not the
individual who attempts public service work be required
to safeguard his patrons? He should be held responsi-
ble, and his responsibility should be beyond any question
of doubt. Every street car is constructed with an al-
lowance of safety beyond any possible occupancy. The
placing of passenger-carrying bodies, with seating ca-
pacities of from ten to fifteen people and standing room
for as many more upon a second-hand pleasure car
chassis or equipment, originally built for a maximum
load of four to seven passengers, and bodies not more
than one-third to one-half the weight of the bus bodies,
endangers life and should not be allowed. These condi-
tions now exist wherever the jitney movement is under
promotion, and in the end must prove disastrous.

We would quickly condemn the public service corpora-
tions were they to offer the public such a conglomera-
tion of unsightly and unsafe equipment as may now be
seen upon the streets of many of our cities. I do not
mean to discourage the movement, but I believe we
should be fair to ourselves in demanding safety and
fairness to those whom we have invited to come into our
communities and invest their money in public cor-
porations and from whom we have always demanded
every comfort and safeguard. The adoption of the air
brake and block signal by the railroads came from the
demand for protection from their patrons and a realiza-
tion by the railroads of the value of such protection to
their patrons. The old wooden coaches, when all went
well, delivered their occupants to their destination but
not with that assurance of safety as with the present-
day steel coaches. Why should not the same considera-
tion be given in the transportation of passengers over
the streets of our cities?

S. M. WILLIAMS, Sales Manager.

Equipment and Its Maintenance

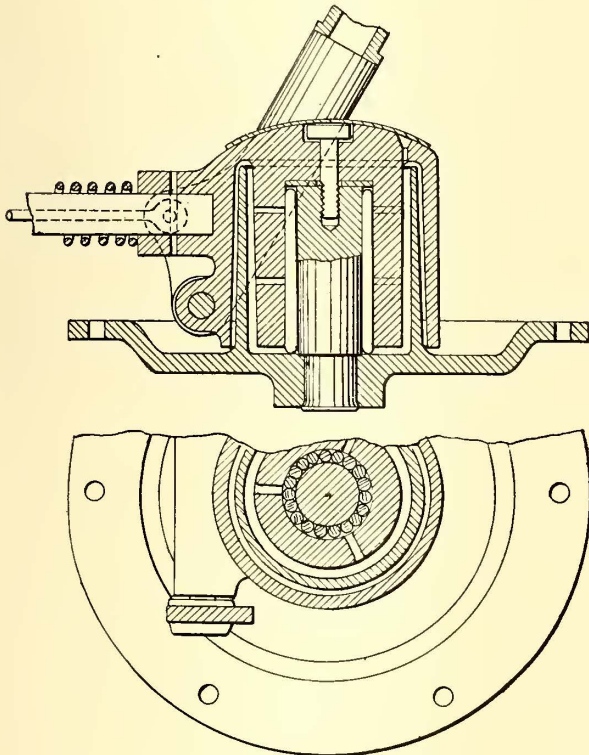
Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Sioux City's Self-Lubricating Trolley Stand

BY C. M. FEIST, MASTER MECHANIC SIOUX CITY (IOWA) SERVICE COMPANY

Self-lubrication combined with a dustproof, water-tight bearing has been attained in the trolley stand which has been in use on the Sioux City (Iowa) Service Company's cars for the past three years. This end was accomplished by designing the top member of the stand so that it completely incloses the bearing portions of the bottom member. These two members in turn are so constructed and arranged with respect to each other that intercommunicating oil wells and passages are produced which practically maintain all the bearing surfaces in a state of constant lubrication. A plan and a



SIOUX CITY SELF-LUBRICATING TROLLEY STAND

section of this stand are shown in the accompanying illustration. Ninety of these self-lubricating bases are in service on the company's cars and all of them were finished in the company's shops. The cost of each stand complete is approximately \$10.50. Fifty of the stands have been in service for three years and are still in perfect condition, it being necessary, however, to add a little oil each spring to make sure that the lubrication is perfect.

As mentioned before, the stand comprises essentially two parts, a top and a bottom casting. The bottom casting is dished and made with a centrally-located bearing post and a vertical annular wall concentric with the post. The annular wall is integral with the base plate and the bearing post is formed by a pin riveted

at its lower end to the plate. The cap or top casting is also integral in construction and rotates on the base. It is formed with inner and outer annular walls, the inner wall fitting into the space between the annular ring of the bottom casting and the post. Ducts through the inner top casting ring permit oil to flow freely on each side of it.

The cap is fastened to the center of the post by a stud bolt. The lower portion of this bolt screws into the post and the head fits into a recess in the cap casting. A brass washer interposed between the upper end of the post and the under base of the cap forms the bearing seat. By this arrangement the cap casting is supported entirely on the bearing post and rotates freely. The lower edges of the top-casting annular walls are a short distance above the bottom of the well formed by the bottom casting, hence friction between these parts at this point is obviated. The oil chamber between the post and the walls of the top casting is designed to receive a series of anti-friction roller bearings which fix the position of the upper casting on the post. In this way the side and vertical bearings are immersed in oil at all times, and being entirely inclosed are free from dust and water tight.

Reinforcing Metal Poles

BY G. H. M'KELWAY, LINE ENGINEER BROOKLYN RAPID TRANSIT SYSTEM

In practically all large cities and also in many places where not only good appearance but also permanence is required, the metal pole, either iron or steel, has replaced the wooden pole which was at one time the standard. Although the first cost of the metal pole is much more than that of the wooden one, yet the former lasts so much better than the latter that, except for temporary work or where the wood poles can be obtained very cheaply, the iron or steel is to be preferred.

But the metal pole has been in service long enough to show that it cannot by any means be considered as a permanent fixture and that in time it must be either repaired or replaced. It might be supposed that careful painting would so prolong its life that it could be considered as never having outlived its usefulness, but the truth is that where the protection is most needed is the point where it is most difficult to apply the paint. A careful examination of the tables prepared by the manufacturers of trolley poles will convince a person that the weakest point on the pole, if it be made up of three sections of pipe, which is standard practice, will be at the base of the second section. Yet very few poles fail at that point and when they do they are nearly all new poles. After a pole has been set in the ground long enough to become weakened by rust the almost universal point of failure will be found to be at the ground line or very near to it.

So well have the manufacturers recognized the fact that there is the weakest point that they now make many poles with sleeves of standard or even extra heavy weight either rolled or shrunk on to the lower section at the ground line and so placed that when the pole is set the ends of the sleeve will extend a foot or

more above and below the surface of the ground. By the use of such a sleeve the thickness of the pole at the ground line is perhaps doubled and the life of the pole is increased even more than that, as, of course, it is not necessary that the pole be eaten entirely through before it fails.

Poles that have been set without the sleeves can be reinforced by either installing such sleeves after the rusting has begun or by interior reinforcement. The latter plan can be used even if the pole has been equipped with a sleeve. It could be arranged to install a second sleeve over one that had already been installed but that had been eaten through, although the writer has never heard of such a practice. The principal objection to such a plan would be the steadily increasing diameter of the butt of the pole owing to the added sleeves.

When reinforcing by means of the sleeve is used a choice can be made between the use of a solid or a split sleeve. If the solid sleeve is to be used on a pole already in service all of the arms and wires attached to it must be removed so that the sleeve can be slipped over the top and drop to its place at the butt. Many poles have ornamental rings placed around the joints and also at the ground line and these must be removed before the sleeve can be lowered into position. These rings or collars, although adding slightly to the appearance of the pole, are of no value in protecting the pole against rust, a claim sometimes made for them. On the contrary, they weaken rather than strengthen the pole because they afford a place where water can settle and remain instead of running off at once, as it will do if the joint is properly made and the ends of the pipe are chamfered so as to give no place for the water to lodge.

Either before or after the sleeve has been slipped over the pole, the ground or pavement at the base is broken away and excavated to a sufficient depth to allow the sleeve to be put on at the right height. The sleeve is then supported at the right height and the earth tamped around its bottom to hold it there. After that the sleeve is fastened to the pole by pouring into the annular ring between it and the pole a liquid material which will harden and hold them fast together. The first material to be used between the sleeve and the pole, so far as the writer is aware, was molten lead. This has now been superseded generally by either cement grout or sulphur. The grout is the more common filling material as the use of sulphur is patented, being the base of the patents issued to C. B. Voinow of the Philadelphia Rapid Transit Company. The sulphur, although costing more than the grout, makes a better job as it not only holds the sleeve tighter to the pole and so increases the strength of the pole, but also is an insulator and therefore prevents the leakage of current to the ground at the ground line, although of course leaving a path open for it further down where it will not do so much damage.

Many persons regard the claim that poles are injured through the leakage of current from the trolley wire or feeders through defective or weak insulators as being unfounded, but the writer cannot agree with them. Its truth was forcibly impressed upon him at one time when he was examining the poles on a certain street where all on one side of the street were in good condition but on the other side there were many badly weakened at the ground line. The only explanation that could be given for the difference in condition was that where the poles were bad they were used to support not only the spans and trolley wire but also a feeder wire, so that the deterioration must have been caused by electrolytic action due to the leakage of cur-

rent over the feeder insulators and down the poles to the ground.

When pouring the sulphur into the opening between the pole and the sleeve a piece of leather is held around the sleeve with its top slightly higher than the top of the sleeve. This is for the purpose of having the sulphur at the pole, when it solidifies, a little higher than at the sleeve, a result that is accomplished by wiping off the outer edge of the sulphur before it becomes too hard. The effect of this treatment is similar to that of a chamfered sleeve and causes the water to run off instead of lodging between the sleeve and the pole, which would occur if this plan was not followed and which does occur very often when the sloping portion of the sulphur is broken off after it has been carefully installed. This trouble is not confined to poles where sulphur has been used but is also found where the filling between the sleeve and the pole is of cement, which also should be so sloped off as to permit all water to escape.

The slipping of the sleeve over the top of the pole requires considerable work and makes a rather expensive repair when a number of spans or pull-offs are attached to one pole or when one or more feeder arms are attached to the pole and must be removed and the wires cared for while the sleeve is being put into place. In order to avoid this difficulty split sleeves have been used which need not be slipped over the pole but are merely put together at its base. These sleeves are made of either steel, or cast or malleable iron. Those first made had lugs through which bolts were passed in order to hold the two halves together. Since much trouble was caused by persons catching and tearing their clothes on the projections of either the lugs or the bolts that type is not much used at present. A malleable-iron sleeve of this type but without its objections is made and patented by the St. Louis Malleable Casting Company. Here the two halves have lugs cast upon them, so placed that the two halves dovetail into each other and are held together by means of steel pins passing through holes in the lugs, which are so rounded off as to prevent the possibility of anything catching in them.

Another sleeve very similar to that just described is made by the Drew Electric & Manufacturing Company, which also consists of a malleable-iron sleeve made in halves. The ends of these halves, however, are formed so as to look as if they had been bent over. As one edge bends outward while the other turns inward they engage with each other and the two parts are fastened together by merely slipping one edge into the other. Both of these last-named sleeves are made $\frac{3}{8}$ in. in thickness but the Drew sleeve is further reinforced by ribs that run down it from end to end. Both have inwardly projecting lugs which keep the sleeves a short distance from the pole and allow a space to be filled with cement or some similar material.

There is one more type of reinforcement which not only does away with the necessity of stripping the pole of its cross-arms and other attachments but also avoids the necessity of any digging about the foot of it in order that the sleeve may project below the ground level. In order to avoid these troubles the reinforcement is applied to the interior instead of to the exterior of the pole and consists of a plug of reinforced concrete.

Although poles have been reinforced by dropping into them a piece of tee-rail and filling in around this rail with concrete, this does not insure a good job as the piece of rail is not likely to be well centered, so that the pole is stronger in one direction than in another and there is no way of insuring that the direction in which

the greatest strength can be shown will be the same as that from which the greatest pull will come. Again, there is not the same adhesion between the concrete and the steel in this plan that there is in some of the others in which concrete is used.

A patent has been obtained for the use of a piece of pipe instead of the rail but by whom the writer does not know, and he also has never heard of the plan being widely used.

In the system installed by the New York Pole Company, which is covered by patents, the reinforcement consists of twisted steel rods fastened together at one end by being inserted into a casting and at the other by means of a cap, which, when released permits them to spring out into the shape of an inverted cone. This cone-shaped placing of the rods arranges the steel in the form best suited to the strain coming upon it. The strength of the reinforcement can be altered by changing the size or the number of the rods.

With this method the first thing to be done is to remove the pole cap and then to pour sand down into the pole until it is filled up to a point about 3 ft. below the ground line. The amount of this sand filling to be used is determined by dropping a weighted tape line into the top of the pole and pouring in the filling until the weight rests on the sand at the proper point below the top of the pole. Then the rods, held together at the bottom by the casting and at the top by the cap, are lowered into the pole, and when they reach the bottom the cap is pulled off allowing the tops of the rods to spring out until they touch the inside surface of the pole. Lastly the concrete is poured into the pole until it is filled above the ends of the rods which are generally 5 ft. in length. The pole cap is then replaced and the job is finished.

While this method does not have the protecting quality due to the insulating properties of the sulphur, employed with another plan of reinforcement, yet the reinforced concrete core is generally calculated so as to be equal in strength to a new pole of the size in which it is used as a reinforcement. Therefore, as the reinforcement can be considered as being indestructible, the pole never deteriorates below the strength of a new pole, even if the entire metal shell should rust away at the ground line.

Paint Renovator for Exterior of Cars

BY R. E. HEWITT, MASTER MECHANIC SOUTHERN PACIFIC COMPANY ELECTRIC LINES, WEST ALAMEDA, CAL.

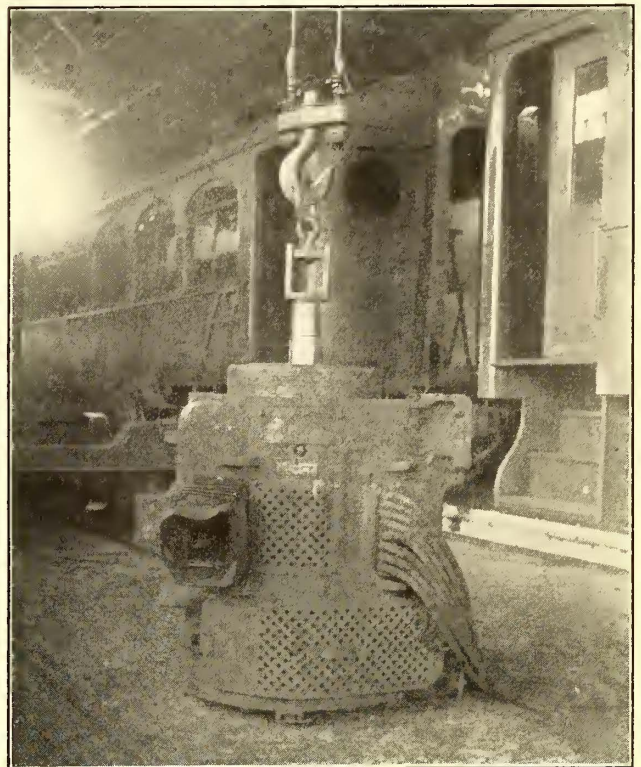
The usual procedure for cleaning paint on cars when they came in for inspection, which is after 1200 to 1500 miles for motor cars and 2000 miles for trailers, was to place them on the wash tables and wash the outside of the car with a diluted mixture of oxalic acid and water, after which the car was thoroughly rinsed off with clear water. Due to the fact that the water used was more or less alkaline, it had a detrimental effect on the life of the paint and varnish. In order to overcome this condition various emulsions and car cleaners were tried without much success. Finally an experiment was made with what is known as Brook's "Car Renovator" and results obtained therewith have been most satisfactory.

This renovator is applied to a car once a month, and between these applications the car is simply rubbed down with clean waste. The renovator has a tendency to feed the varnish and paint, lengthening the life of both, and keeps the paint on the car looking clear, bright and otherwise presentable. This renovator has been adopted as standard for car cleaning by the Southern Pacific Company's electric lines.

Armature Removal

BY R. R. POTTER, SUPERINTENDENT OF EQUIPMENT NEW YORK, WESTCHESTER & BOSTON RAILWAY

The box type of motor frame has many obvious advantages, but its use involves a certain amount of difficulty in making repairs because of the lack of ready access to the armature that was the prominent characteristic of the early split-frame designs. The common method of dismantling the box-type motor requires the installation of a special machine with a heavy bedplate upon which are mounted two arms or centers to support the armature and a movable carriage upon which to rest the motor frame. This arrangement permits the frame to slide longitudinally off the armature after removing the bolts from the bearing housings, and the armature may then be inspected as it rests on the centers or else may be removed and transported to another part of the shop for repairs. However, this method is slow, and the

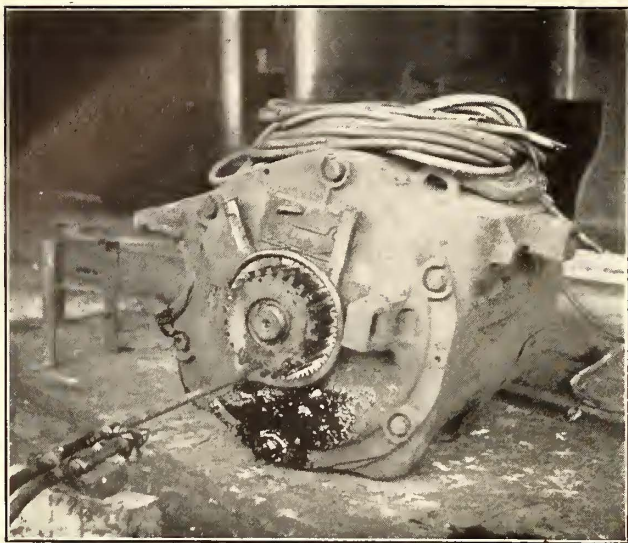


WESTCHESTER ARMATURE REMOVAL—LIFTING ARMATURE OUT OF FRAME

machine requires some skill in handling and involves a considerable investment as well as a material amount of valuable space upon the shop floor.

Wherever the shop space is limited and when economy has to be carefully considered the use of a special machine for armature removal is obviously undesirable, and as a substitute the method described in the following paragraphs may be used to good advantage. The only equipment required is an overhead crane or other lifting device, which is needed in any case if the armatures are to be handled with reasonable economy. This method, it may be said, has been in use at the shops of the New York, Westchester & Boston Railway for the past three years, during which time it has proved to be thoroughly satisfactory in every respect.

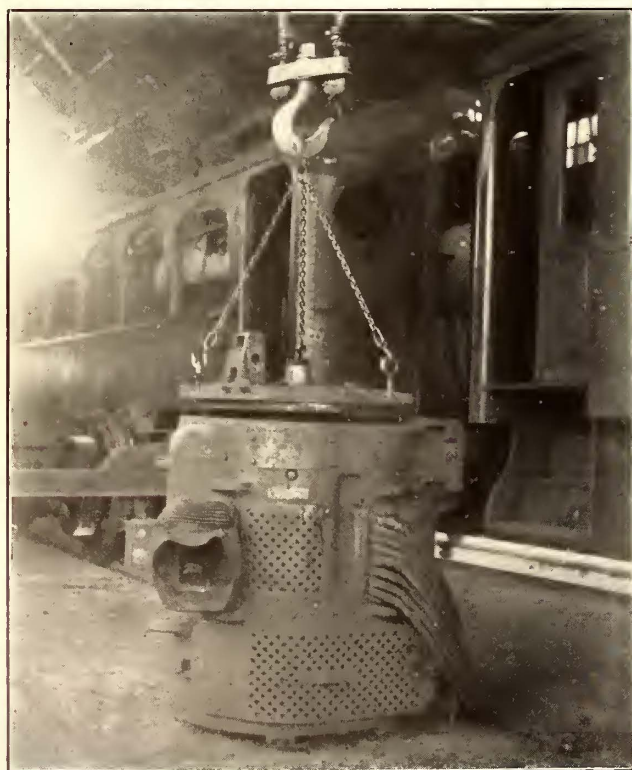
Under the method in question the first step is, of course, to remove the oil and waste packing from the motor bearings. The pinion nut is then unscrewed, and the pinion is heated gently with the circular flame of a gas pipe heater and at the same time wedged away from



WESTCHESTER ARMATURE REMOVAL—HEATING PINION

the bearing housing until it comes off. After the removal of the pinion the motor is placed upon the floor with the commutator-end down and the pinion-end up. This allows easy access to the nuts for the pinion-end bearing housing, and these are unscrewed, permitting the housing to be lifted off the frame. A special bail, or swivel ring, with the lower portion threaded to fit the threaded end of the armature shaft, is then screwed onto the shaft in place of the pinion nut to provide a hold for the crane hook. With the aid of the crane, or any other suitable form of lifting apparatus, the armature may then be readily lifted out of the motor frame and moved to any part of the shop for inspection and repair.

The motor frame is left in the upright position in which it is originally placed, because when the frame is in this position the windings, brush-holders and other



WESTCHESTER ARMATURE REMOVAL—LIFTING OFF END HOUSING

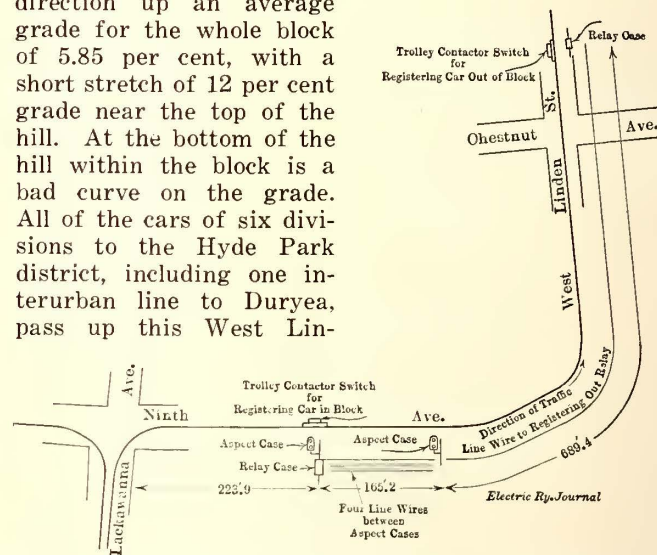
interior parts may be readily inspected and repaired, although it is, of course, possible to move the frame into any other location or position that may be more convenient. The return of the armature to its frame when the motor is again ready for assembling is accomplished by a reversal of the process previously described.

With a reasonable amount of care in centering the hoisting cable over the frame during the operation, the danger of injury to the windings is minimized, because the point of support is directly over the center line of the armature shaft and the armature hangs in a perfectly vertical position. Consequently, when the armature is raised from or lowered into the frame there is no possibility of its becoming fouled on the pole pieces or brushes. A traveling electric crane is, of course, especially suitable for this work, and it offers the advantage of transporting the armature with a minimum of handling to whichever part of the shop is most convenient for making repairs. However, the use of a jib crane or air hoist is just about as convenient in so far as the actual removal of the armature is concerned.

Special Application of Car-Spacing Signals

BY A. P. WAY, ELECTRICAL ENGINEER AMERICAN RAILWAYS COMPANY, PHILADELPHIA, PA.

An interesting installation of a car-spacing signal has been in operation on the property of the Scranton (Pa.) Railway since March, 1915. The installation has materially improved a difficult situation of car operation on a steep hill including a bad curve. The accompanying diagram shows the general layout of the single track, upon which a heavy schedule is maintained in one direction up an average grade for the whole block of 5.85 per cent, with a short stretch of 12 per cent grade near the top of the hill. At the bottom of the hill within the block is a bad curve on the grade. All of the cars of six divisions to the Hyde Park district, including one interurban line to Duryea, pass up this West Lin-



CAR-SPACING SIGNAL—DIAGRAM SHOWING RELATIVE POSITIONS OF TROLLEY CONTACTOR SWITCHES, RELAY CASES, ASPECT CASES, ETC.

den Hill making twenty-two regular cars per hour. The average headway is therefore 2.7 minutes under regular schedule, but it is less during evening rush hours. Heretofore cars frequently became bunched on the hill, making a very heavy peak load on the feeder and often opening the feeder circuit breaker. On numerous occasions motormen were unable to hold their cars on the hill with heavy load, with power off the line, and could not prevent them from backing into following cars with consequent damage. Now only one car is allowed on the hill at a time, which keeps the power peaks down

and the cars better spaced. The depreciation of trolleys has also been materially reduced.

The diagram shows the relative locations of trolley wire, trolley contactors, aspect cases and relay cases.

Two aspect cases are used, each being equipped with a red lens and a green lens. Normally when the block is unoccupied a green light is displayed in the first aspect case directly opposite the entering contact-maker and a red light is displayed in the second aspect case about 165 ft. ahead. A motorman can enter the block if green is displayed at the first aspect case. Upon passing beneath the contact-maker, if the signal operates properly, the red light in the second aspect case will be extinguished and the green illuminated, giving him permission to proceed, while at the same time the green light will be extinguished on the first aspect case which is now behind the car, and the red will be illuminated, protecting his from a following car. Thus each car passing into the block runs by two green lights and leaves a red light behind it in the first aspect case.

If, however, a car should not properly operate the signal mechanism it would be stopped by the red light in the second aspect case. It will be seen that there is at all times a red light showing in one of the other of the aspect cases and a green light in the other. These two lights are in series and the opposite two lights are in series.

When the car passes out of the block under the contact-maker at the top of the hill the lights return to normal indication. The accompanying halftone shows contact-maker, aspect cases and relay box at the entering end of the block, located near a left-hand curve at the bottom of the steepest portion of the hill. The relay at the leaving end allows a normally alive operating wire which prevents the signal being cleared if the wire becomes crossed with the trolley. Provision is made that a dead ground or 'open' in this wire will prevent the signal being operated to show a proceed indication and will hold cars up by the red light.

A second lamp is provided in each aspect case to come into operation when one burns out, and constant current is provided in the lamp circuit to give uniform illumination with variable voltage. The current regulator is a simple laminated core solenoid device which so regulates the current that the amperage remains constant in the signal lights, regardless of the fluctuation in line voltage. This is ingeniously accomplished by having the core of the solenoid shunt steps on a resistance tube

to increase or reduce the resistance in the line as the voltage rises or falls. The lamps are hooded and show well even with the sun shining against them.

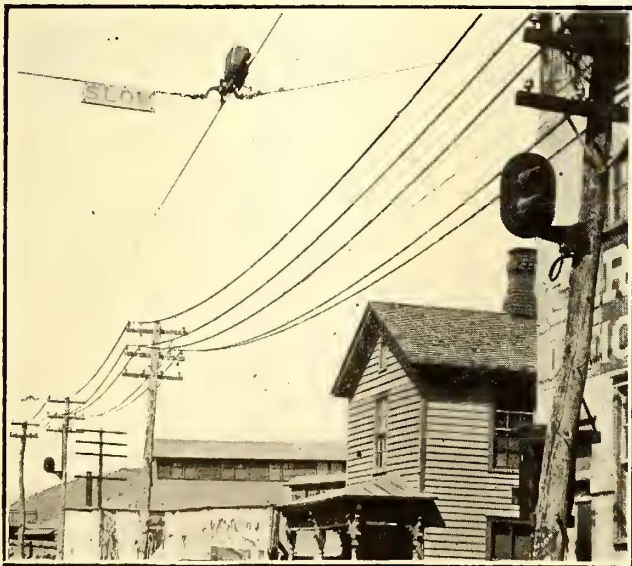
The signal has operated to date without failure, has given protection to approximately 44,000 through car movements, and has relieved an unsatisfactory operating condition. The signal used was purchased from the United States Electric Signal Company and is known as the Type S-2 car-spacing signal.

New 9-In. Grooved Rail for M. C. B. Flanges

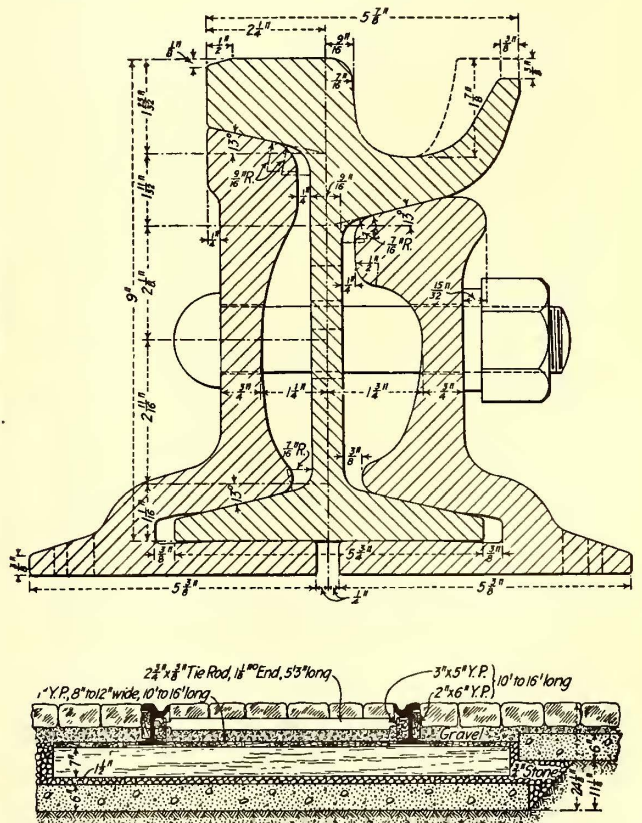
The South Philadelphia improvement, now being carried out by the city of Philadelphia and the Pennsylvania and Baltimore & Ohio Railroads, involves, among other things, the laying of several miles of permanent track at grade in Delaware Avenue. In this connection the railroads and the city have worked out a design for a 159-lb. girder rail for general use in the city streets. Cross-sections of the rail and splices and of the approved form of track construction are shown.

Each joint is held with four 1 1/4-in. bolts, passing through 1 7/16-in. holes in the rail web, 1 5/16-in. round holes in the inside splice, and 1 5/16-in. x 1 3/8-in. elliptical holes in the outside splices. The spacing of the four holes is 7 1/2 in., 5 1/2 in. and 7 1/2 in., and the angle plates are 26 in. long. Each plate has two slots and two holes for spikes. The rails are laid on four-hole tie-plates 10 3/4 in. x 7 in. x 3/8 in., with a 3/8-in. shoulder on top and a 1/4-in. shoulder on the bottom. The ties are spaced eighteen to a .33-ft. rail, and for each 33-ft. length the rails are connected with six tie rods, consisting of 2 3/4-in. x 3/8-in. forged bars threaded at the ends and held by a standard square nut each side of each rail web.

The adaptability of this type of rail for tracks laid and operated in a public street used intensively by all



CAR-SPACING SIGNAL—SIGNAL EQUIPMENT AT ENTERING END OF BLOCK



CROSS-SECTIONS OF JOINT AND TRACK, DELAWARE AVENUE, PHILADELPHIA

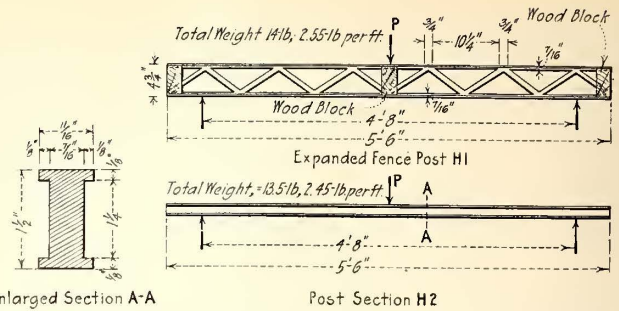
classes of vehicles was carefully considered before a conclusion was reached.

Arrangements have been made with the Pennsylvania Steel Company to supply this new section of rail, which is undoubtedly the heaviest rail of the grooved girder type in this country for which rolls have already been cut.

Steel Pole Strength Per Pound Increased

The demand for a light steel pole weighing about the same as a wooden pole and costing but little more has been supplied by an expanded-metal steel pole which has been put on the market recently. This pole is manufactured from a special rolled H-beam section by an expansion process which increases the strength about 400 per cent without adding to the weight. Accordingly comparatively light sections which, as they come from the rolls are not strong enough to serve as poles in span-wire construction, are sheared, expanded hot and formed into Warren trusses which furnish sufficient strength to meet any average line demand. Although the result is unusual it is logical from an engineering standpoint since it is a well-known fact that a truss structure provides maximum carrying capacity at minimum weight. By utilizing the web for the truss members the expanded-steel pole has no metal which is not performing its proportional share in carrying any load applied to the pole.

An expanded 6-in. H-section in a 30-ft. pole tapers from 6 in. at the top to 17 in. at the base. Careful tests to determine the strength of this pole indicate that it will carry eighty No. 8 wires at 100-ft. spacing or twelve No. 4 wires at 300-ft. spacing. A 30-ft. pole weighs complete without cross-arms or fittings 588 lb., which is slightly in excess of the weight of the 30-ft. wooden pole required for span-wire service. On the other hand, this expanded metal pole costs little more than



EXPANDED AND UNEXPANDED POST SECTIONS, SHOWING POINTS OF APPLICATION OF TEST FORCES (See table)

twice the wooden pole but has much greater strength. Under actual test, a force of 1500 lb. applied 18 in. below the top of a 30-ft. pole set 5 1/2 ft. in the ground, deflects the pole 1 11/16 in. A comparison of the strength of one of these expanded sections with the original section is shown in the accompanying illustrations. This test was made in the Illinois Steel Company's testing laboratory, and the results show quite clearly the increased metal efficiency obtained by the expanded process. Any tendency of the metal to crystallize or fatigue in the expansion process is obviated by preheating the sections to a cherry red just before they are expanded.

The advantages claimed for this pole by the Bates Expanded Steel Truss Company, Chicago, Ill., the manufacturers, include primarily a light-weight steel structure of great strength which may be installed at a cost of material and labor equal to that of wooden poles. Maximum life is obtained by setting these poles in concrete and being a one-piece structure with all exposed surfaces, all parts are readily accessible for painting. The metal is 1/4 in. thick, consequently will resist corrosion for a long time. The pole also has all the advantages of a fabricated structure but the elimination of bolts and rivets permits equivalent strength at a greatly reduced weight. Being a light-weight simple structure these poles are as readily and cheaply set as wooden poles and require no special apparatus. Wooden or steel cross-arms may be attached to these poles by L-bolts, the poles being drilled for any number at the time they are manufactured. It is also interesting to note in connection with the manufacture of these poles, that they are dipped while hot into a special preservative bath shortly after they leave the expansion machine. In the heated condition the preservative penetrates the metal which should give it extraordinary life in resisting the elements. The expanded-metal pole is only one of many products which this company is marketing. The others include expanded-metal concrete reinforcement, expanded-metal fence posts, car sills and truck frames.

Cause of Noisy Gears

In an English contemporary it is suggested that noisy gears are caused by small quantities of air which are trapped in the interstices between the teeth that are in mesh and then are hurled out at sufficient frequency to produce an audible musical note, the general action resembling that of the siren. Tests show that the pitch of the note is a simple function of the number of teeth passing a given point per second. For example, a thirty-six-tooth gear making 484 turns per minute (giving 290 teeth passing a given point per second) gives the note that is produced on the standard musical scale by a frequency of 290. Where more than one pair of gears are operating the interferences obscure the musical note and produce an objectionable noise.



CORNER POLE

EXPANDED POST H1		
Load P in Pounds	Deflection in 0.001 in.	Set in 0.001 in.
100	9	
200	12	
300	23	
400	30	
500	45	
600	55	
700	46	
800	61	
900	63	
1000	66	
1100	91	
1200	82	
1300	92	
1400	104	
1500		
1600	120	No.
1700	121	2
1800	122	1
1900	136	2
2000	146	4
2100	145	4
2200	150	4
2300	179	11
2400	173	11
2500	190	15
2750	214	26
3000	238	37
3250	454	239
Failed by bucking in top flange at 3250-lb. load.		
POST SECTION H2		
Load P in Lbs.	Deflection in 0.001 in.	Set in 0.001 in.
100	200	
200	250	
300	300	
400	350	
500	500	
600	680	5
Failed at 600-lb. load.		

TABLE OF RESULTS OF TESTS



TROLLEY POLE

News of Electric Railways

PROTECTING LONG ISLAND AUTOMOBILISTS

One Automobile Every Four Seconds at Merrick Road Crossing Presents Safety Problem

The extent of automobile traffic on Long Island, and the urgent necessity for co-operation by motorists in the efforts to prevent accidents at railroad crossings, are strikingly shown by the results of a special count of the traffic taken on Sunday, Aug. 8, by the Long Island Railroad. At the Merrick Road crossing, in Springfield, 9408 automobiles passed between midnight Saturday and midnight Sunday. Of these 4245 were east-bound and 5163 west-bound. At the Barnum Island Road crossing, on the Long Beach branch, 4739 cars passed in the same period, of which 2620 were east-bound and 2119 west-bound. In the single hour from 11 a. m. to noon on Sunday, 845 motor cars passed over the Merrick Road crossing. This is at the rate of more than fourteen cars a minute, or about one every four seconds. The cars counted at these two crossings were, of course, only part of the total number that were operated on Long Island on Aug. 8. Furthermore, nearly all of them must have crossed the company's tracks at other points, not once but several times during a day's run.

The Long Island Railroad is continuing to do all in its power to protect the crossings. Heavy pole gates similar to those recently put in operation on the Long Beach branch have been installed at Central Islip, Suffolk County, protecting the main line tracks through that town. These gates are expected to prove a deterrent to those motorists who, in the past, have been reckless enough to dash their cars through the lighter wooden gates directly before approaching trains. The company has been authorized by the Board of Supervisors of Nassau County to install, at certain points, traffic posts similar to those used by the New York City traffic squad. It is expected that this will be very helpful in the campaign for safety.

STILL ANOTHER COMPANY PUBLICATION

Puget Sound Company Recognizes Value of Proper Propaganda Work

The Puget Sound Traction, Light & Power Company, with head offices in Seattle, Wash., has closed the contest which had for its object the selection of a name for a pamphlet issued by the company in the interests of the company, its employees and its patrons. The pamphlet first made its appearance on the cars of the company July 28, and since that date has appeared regularly each week. To date the leaflet is known as *What's Its Name*.

The contest mentioned closed on Aug. 15, and it was announced that the name selected would be made public on Aug. 25. Three prizes were offered as follows: \$15 for the best name; \$10 for second best and \$5 for third best. In speaking of the contest *What's Its Name* said:

"Some of the suggestions sound good, but we won't give them away until Aug. 25. A number of them are red-hot brickbats, not without a touch of humor. For instance: *The Last Gasp*, *The Wail*, *The Sardine Box*, *The Apologist*, *The Last Stand*."

In addition to propaganda the publication contains information of value to the traveling public, such as city car schedules, interurban schedules, etc. Through it the company is placing before its patrons the side of a corporation in the controversy between the local company and the city of Seattle. In the issue of Aug. 11, *What's Its Name*, on a page entitled "Out in the Open," said:

"Some people have criticised us because we have applied to the Public Service Commission of this State for relief from the continued attacks made on our business by the city of Seattle. 'Brazen audacity of a predatory corporation' is what critics call it. It's nothing of the kind. In taking our case before the State Commission, we told the truth, went into all the details, made a clear and concise statement of our position—and asked for judgment and justice, nothing more."

DISORDER IN WEST PENN STRIKE

The cars of the Allegheny division of the West Penn Traction Company, Pittsburgh, Pa., were tied up on Aug. 19 by a strike of the union operators, who demanded the recognition of their organization. The company issued a statement asking the indulgence of its patrons until it could resume operations. This statement announced that the company was recruiting new men. The company says that its open shop contract runs until 1916 and was signed by all its employees. It is asserted that no favoritism was shown to anyone, whether a member of the union or not, and that all men who desired to do so might belong to the union without prejudice. On Aug. 21 the company re-established service. Disorder followed almost immediately, and on Aug. 22 several cars were stoned and one was set on fire in East Deer Township. On Aug. 24 Patrick Gilday, head of the State Bureau of Mediation and Conciliation, and Francis Feehan, local representative of the department, interviewed representatives of the company and striking employees of the Allegheny division. Mr. Gilday was quoted as stating that there was every hope of a speedy settlement by a submission of the controversy to arbitration.

RHODE ISLAND ARBITRATION

Hearings in the Rhode Island Company arbitration proceedings were continued at Providence with the introduction of evidence by employees in miscellaneous shop departments on behalf of the union. Five weeks of testimony have now been heard by the board. The company's side of the case will probably be begun soon. In the recent proceedings, W. D. Wright, superintendent of maintenance and equipment, said that had there been no union agreement, it would have been probable that the wages of men in the shop would have been increased in the past two years, following a policy of recognizing able workmen. Considerable evidence was presented by the men as to the compensation of various trades in the shops. Among the hourly rates were: welder, 28 cents; wheel grinder, 28.5 cents; tinsmith, 33 cents; radial drill operator, 26.5 cents; wheel stripper, 23 cents; car cleaner, 23 cents; storekeeper, 25.5 cents; assembler, 22 cents; babbitters, 24 cents and 29 cents; valve grinder, 32 cents; boring mill operator, 29 cents; air compressor repairer, 28 cents; blacksmith, 31 cents; car wiring, 20 cents and 26.5 cents; steam fitter, 25.5 cents; armature winder, 22 cents and 23 cents; carpenter, 32 cents. The board has visited the principal shops, power plant and electric freight station of the company. In testifying about power plant conditions, a switchboard operator said that while the capacity of the Manchester Street station at Providence has been increased 50 per cent in the last eight years, the work of a switchboard operator has not increased in severity although the responsibility was greater now.

BIDS RECEIVED FOR RAPID TRANSIT MATERIAL

During the week ended Aug. 21 the Public Service Commission for the First District of New York opened bids on many important rapid transit contracts. Following are the lowest bids received on the contracts, excepting that for the supply of ties and timber, which is not yet available:

Station finish, Routes Nos. 16 and 18, being respectively the Jerome Avenue and White Plains Road elevated lines in The Bronx: Altoria Realty & Construction Company, \$860,636. Supply of felt pads: The Q & C Company, \$9,957. Tie plates: Type "A," Herbert W. Lockwood, \$123,975; type "B," L. D. Rockwell, \$13,267; type "C," L. D. Rockwell, \$5,140; type "D," Herbert W. Lockwood, \$8,239; types "E-2," "W" and "X," Ramapo Iron Works, \$2,901. Cast iron: American Brake Shoe & Foundry Company, \$10,528. Special Work, Order No. 3: Ramapo Iron Works, \$54,950. Special Work, Order No. 4: William Wharton, Jr., & Company, \$41,907. Malleable iron: Foran Foundry & Manufacturing Company, \$36,118. Screw spikes: American Iron & Steel Manufacturing Company, \$25,741.

The contract for ties and timber calls for about 35,000,000 board feet, for use on all lines of the dual system.

EXTENSION OF CIVIC OPERATION RECOMMENDED

R. C. Harris, Works Commissioner of Toronto, Ont., has reported in favor of civic operation of the Mimico and the Scarboro branches of the Toronto & York Radial Railway. Replying to a request from Mayor Church for an expression of his views on the question, Mr. Harris on Aug 10 reported as follows:

"I am of opinion that, having decided to acquire the Mimico and Scarboro branches of the Toronto & York Radial Railway, the city should operate a service over the section acquired, namely, within the city limits. I estimate that the deficit on operation alone, after crediting probable fares, would amount to \$23,200 annually on the Mimico line and \$21,280 annually on the Scarboro line. This is, of course, exclusive of interest, sinking fund and depreciation. When Kingston Road is widened a further expenditure will be entailed for permanent double tracks, located in the center of the roadway. Against these deficits would be credited such amounts as the Ontario Railway Board decides should be paid to the Toronto & York Radial Railway for operating privileges."

Of the Mount Pleasant Road car line Mr. Harris says that if the property for the complete extension is acquired he will, at the next meeting of the committee on works, present bridge plans for the crossing of the Belt Line Railway. It will then be necessary to proceed with the grading of the street and the construction of the railway. Prior to construction being started it will be necessary for the corporation to adopt a policy as to the southerly terminus of the line.

THE STORM AT ST. LOUIS

The storm of Aug. 20 played havoc with the steam and electric lines at St. Louis. Despite the adverse conditions, traffic was restored on the morning of Aug. 21 on nearly all of the divisions of the United Railways with the exception of the Jefferson Barracks, Creve Coeur Lake and Market Street and Manchester lines west of Kings Highway and the Kirkwood-Ferguson line. The University line was placed out of commission early on Aug. 20, as water flooded the tracks and made traffic impossible. About 8 p. m. the line was re-opened. The regular Creve Coeur line suspended operations entirely. Passengers to Vinita Park were carried over the Midland line from Page Avenue and the Suburban tracks. Cars to Jefferson Barracks were unable to cross the bridge at the River des Peres, as the spans were considered dangerous early in the day. While the cars on the Cherokee, Tower Grove, Bellefontaine, Cass Avenue, Seventh Street, Broadway, Grand Avenue, Jefferson Avenue, Sarah Street, Union Avenue, Wellston, Broadway, Park, Compton, Eighteenth, Natural Bridge, Vandeventer and Page lines did not run on schedule, traffic was not suspended on these divisions. Special telephone operators were placed at the switchboards at the general offices of the United Railways at Park and Vandeventer Avenues to furnish information to the public as to traffic conditions. More than 3000 inquiries had been answered up to 9 o'clock p. m. on Aug. 20.

DECISION IN TORONTO EXTENSION CASE

The Ontario Railway & Municipal Board on Aug. 16 confirmed the right of the Toronto & York Radial Railway to construct a line connecting its Yonge Street tracks with a proposed terminal on its Farnham Avenue property. The board's judgment approved the company's application and plans, subject to modifications that may be necessary after hearing the city's objections on engineering grounds. The judgment, which overrules the city's objections on legal grounds to the company's application, was not pleasing to Mayor Church, and the Board of Control may be asked to authorize an appeal against the order. Chairman McIntyre, in giving judgment, stated that there could be no doubt whatever of the need of such a terminal as was proposed, since the returns of the company showed that 5,000,000 passengers and considerable freight were carried annually. The chairman said:

"The right claimed by the company is so trifling an amplification of rights long enjoyed without question, and so obviously necessary to the proper discharge of its functions, that it might well be held to be implied on the ground of powers lawfully exercised by the company for years."

He said further that, apart from implied authority, the express terms of the railway act warranted the conclusion that the company was entitled to connect its tracks with its terminal.

The Board of Control, in conference privately with the city legal department, decided on Aug. 17 to appeal to the Privy Council against the decision of the board in allowing the Toronto & York Radial Railway Company this right. The Board of Control claims that its decision in appealing is not so much a question of the right-of-way across the street being a menace to the public as of a policy on the part of the city. One of the comptrollers said:

"If the company secures that right-of-way, there is a possibility that the Canadian Northern Railway interests might extend their steam railway over the present right-of-way along the west side of Yonge Street to the old terminal."

If such should be the case the city might not be able to prevent the steam road from connecting with the radial lines, because the steam road has a dominion charter. The city previously received a decision from the Privy Council preventing the Toronto & York Radial Railway from crossing the streets south of Farnham Avenue over its own private right-of-way.

WORK OF NEW YORK INDUSTRIAL COMMISSION

A statement of the working of the new State Industrial Commission law in New York was prepared for the *New York Times* by W. C. Archer, second deputy commissioner in direct charge of the settlement of claims, and approved by John Mitchell, chairman of the commission. The statement, published on Aug. 24, follows in part:

"The new Industrial Commission which superseded the State Workmen's Compensation Commission and the Department of Labor on June 1 finds itself after two months in command of the situation but with its hands full of work. It should be appreciated, however, that with functions so vast, powers so various, and duties so numerous, it will take time for the commission to develop the plans in the minds of the lawmakers in framing the law creating the department. The new workmen's compensation law under which employers, in accordance with the schedule of benefits, may make direct agreements with their workmen for compensation, has not been in operation long enough fully to develop a normal experience and thus give a basis for accurate and useful comparison with the former law. It may be said, however, that the number of accidents reported is on a par with experience developed under the first compensation laws.

"Fully 90 per cent of compensatable cases arising under the new law have already developed into claims and agreements and the relative percentage is increasing day by day. The first two months under the new law showed a falling off in cases. This is attributable to the general lack of understanding of the terms of the new law, the time required by insurance companies to reorganize to meet the new situation, and the time required to make and distribute the required forms and to become acquainted with them. But the last two months have seen the very reverse of such condition, and the gain has been so rapid as to bring the aggregate up to 90 per cent, and to indicate an early approach to a fully normal condition as measured by the experience of the last year.

"The bureau has about cleared its books of all cases arising before April 1, namely, under the old law, except those which because of continuing disability must reappear from time to time on the calendar until recovery can guide a final disposition. Death benefits and benefits arising out of the more serious cases, such as amputations, &c., will run on, some of them for years and some of them during the lifetime of beneficiaries. In handling its claims this bureau, in spite of the disadvantage of the vacation period, is up to date with its work and few complaints are heard.

"The State insurance fund enters upon its second year with a substantial increase in the amount of business done and with a splendid demonstration of its ability to retain its first year's business. This is a splendid showing, especially in the face of its being compelled to do business without solicitation and with no other means than through correspondence to explain away the many misrepresentations made by those whose personal interest would desire to embarrass it. Notwithstanding its initial lower rates it has

been able further to reduce its rates and at the same time to give back to its contributing employers substantial refunders through rate reductions."

Mr. Archer said that not only did the direct settlement make possible a saving of upward of \$100,000, but that it enabled the commission to keep within 1,000 cases of the calendar, the minimum possible under the two weeks' injury clause, whereas under the old law, by which the commission heard every claim, the calendar was generally about 6,000 cases behind. Under the new law the commissioners hear only claims where the employer and employee are unable to agree upon a settlement.

Plea Allowed for Fuller Particulars.—Circuit Judge Hunt in the Federal District Court at New York has granted the plea of the indicted directors, officials and counsel of the New York, New Haven & Hartford Railroad for an opportunity to learn more particulars regarding the prosecution for conspiracy begun by the government.

Two Holyoke (Mass.) Arbitrators Selected.—William H. Brooks, attorney for the Holyoke (Mass.) Street Railway, has been chosen by the company as its representative in the forthcoming arbitration proceedings dealing with wages and related conditions of working. Former Mayor John J. White of Holyoke has been named by the union as its representative. The third member of the board is to be appointed by Governor Walsh.

Chicago Elevated Moves Offices.—The general offices of the Elevated Railroads of Chicago, Ill., have been moved from the Royal Insurance Building, where they have been for a number of years, to the new Edison Building, at the corner of Adams and Clark Streets. For the present the general offices will be located on the eleventh, twelfth and thirteenth floors of this building, but eventually the entire twelfth floor will be given over to this company. The Edison Building is also the new home of the Commonwealth Edison Company.

Municipal Belt Line Suggested for Baltimore.—Mayor Preston of Baltimore, Md., has sent a plan to the city planning commission for a municipally owned and electrically operated belt line railroad connecting with the Pennsylvania, Baltimore & Ohio, Western Maryland and Maryland & Pennsylvania Railroads, with provisions for new tunnels through the city and a grand union station at the Fallsway and Bidle Street. The proposed roads and tunnels were outlined and suggested by William H. Maltbie and Daniel B. Banks and would represent an outlay of \$17,369,000.

Detroit Purchase Election Nov. 2.—The Common Council of Detroit, Mich., has set Nov. 2 as the day on which the electors will vote on the proposition of purchasing the lines of the Detroit United Railway within the one-fare zone. At a meeting of the Council on Aug. 23, the plan for the purchase and the charter amendment authorizing it were laid upon the table for thirty days, as provided by statute. Mayor Marx, members of the Street Railway Commission and others addressed the Aldermen in advance of the selection of the date, urging the acceptance of the purchase plan.

Washington Valuation Progress.—On Aug. 23, E. W. Bemis, director of the valuation bureau, and Charles L. Pillsbury, his assistant in immediate charge of the work of valuing the properties of the public service corporations in Washington, D. C., reported to the Public Utilities Commission on the progress of the work. Whether or not the valuation of all the public utilities is entirely completed in November, it will be so nearly finished by that time, according to Mr. Bemis, that the commission will be in possession of sufficient information to enable it to take up rate and other questions that have had to be held in abeyance on account of lack of information.

Cincinnati Transit Commission Law in Effect.—The law creating the Rapid Transit Commission of Cincinnati has gone into effect, and Mayor Spiegel has called the attention of the City Council to the necessity of prompt action in passing an ordinance authorizing the appointment of members of the commission. It is the Mayor's idea that there should be public discussions of the subject to ascertain the will of the people in regard to the proposed bond issue and their choice of routes for a rapid transit railway as marked out by the present unofficial commission. It seems unlikely

that the question of issuing bonds will be placed before the voters at the November election. The Mayor states that he will not make public the names of the commissioners until their appointment has been authorized by the Council.

Must Secure Permits for Highway Rights.—Public utility companies seeking to secure rights-of-way on Pennsylvania State highways must first secure permits from the State Highway Commissioner, according to a ruling made by Highway Commissioner Cunningham, in the South Portage Railway controversy. Tracks laid by the company were ordered removed by William Uhler, chief engineer of highways. The company secured an injunction to restrain the State from interfering with the tracks. Later Commissioner Cunningham informed representatives of the company that they must vacate the injunction and remove the tracks, after which the matter would be taken up.

Commissioners Continued as Constitutional Officers.—In a revised article which was reported on Aug. 19 by the committee on public utilities of the New York State Constitutional Convention, the public service commissioners are continued as constitutional officers, despite the criticism which that provision received in the debate before the article was sent back to the committee for revision. The revised draft provides that the present commissioners shall serve out their terms. Their successors will be removable by the Senate on the recommendation of the Governor, who must file a statement giving the grounds for asking their dismissal. Another feature transferred from the old article would prohibit the Legislature from undertaking any rate legislation, except after the Public Service Commission has been consulted and has submitted a report as to the reasonableness of the measure. A new provision in the revised article would permit the Legislature to change the jurisdiction and number of public service commissioners. The two commissions are continued.

Promoting Publicity in Dallas.—Edward T. Moore, manager of the Dallas (Tex.) Consolidated Street Railway, in announcing the appointment of Bradley B. Hogue as assistant to the manager in charge of publicity said in part: "I am glad to announce the appointment of a Dallas man to this position. We believe the steps the company takes to develop further and to improve more fully a Dallas service for Dallas people constitute news items that are a gratification to Dallasites and a valuable advertisement of the progressiveness of Dallas to outsiders. While our desire to give out news items of interest is strong, our nose for news is often weak. We have, therefore, decided on creating this position and filling it with a former newspaper man, who knows a 'story' when he sees one. A part of Mr. Hogue's duties will be to act as sort of first aid to the reporter in search of a story here. I know of nobody who shows more genuine enthusiasm over the job than a reporter after news and when I can help satisfy that enthusiasm I am glad to do it." The appointment of Mr. Hogue was noted in this paper for Aug. 21.

Signing of Construction Contract Ordered.—Supreme Court Justice Shearn in a decision handed down on Aug. 23 granted a peremptory writ of mandamus directing the Board of Estimate and Apportionment of New York City to "reconvene forthwith" and sign the contract with the Holbrook, Cabot & Rollins Corporation for the construction of the Times Square section of the Broadway-Seventh Avenue subway. The mandamus writ carries with it, too, an order that the Board of Estimate prescribe the amount of corporate stock needed to meet the city's obligation in carrying out the contract, and directs the Comptroller to issue the stock "without any condition or proviso whatever." The Public Service Commission is also directed to do its part. The Justice takes into consideration the act of the Board of Estimate in amending the contract with regard to extra work after bids had been opened and the Holbrook, Cabot & Rollins Corporation had been discovered to be the lowest bidder. This action of the Estimate Board was taken on the recommendation of Tilden Adamson, Director of the Bureau of Contract Supervision, after the Public Service Commission had accepted the contract form without alteration and sent it to the Estimate Board for approval. Justice Shearn finds that the Estimate Board had no power to so alter the contract. The principles involved in the case were referred to in the ELECTRIC RAILWAY JOURNAL of Aug. 21, page 328.

Financial and Corporate

ANNUAL REPORTS

Seattle Municipal Street Railway

The City Utilities Department, which has charge of the operation of the Seattle (Wash.) Municipal Street Railway, has issued the following income, profit and loss statement of the company for the year ended May 31, 1915:

Revenues:	Division		Total
	A	C	
Passenger	\$14,854	\$15,749	\$30,604
Freight		1,802	1,802
Miscellaneous	2,938	103	3,041
Total	\$17,792	\$17,654	\$35,447
Operating expenses:			
Way and structures.....	\$ 659	\$2,225	\$2,884
Equipment	1,285	709	1,994
Power	6,056	4,944	11,000
Conducting transportation:			
Passenger conductors and motormen.	10,732	8,764	19,496
Freight conductors and motormen.		788	788
Car house employees.....	3,412	1,201	4,613
Other transportation employees.....	578	1,036	1,614
Other transportation expenses.....	584	277	861
General and miscellaneous.....	79	3,039	3,118
Total	\$23,385	\$22,983	\$46,368
Loss on operation.....	\$5,593	\$5,329	\$10,921
Interest on bonds.....			13,500
Grand total			\$24,421

The Seattle Municipal Street Railway has two lines owned and operated by the city—Division "A" within the city limits, approximately 4½ miles in length, consisting of 3½ miles of double and ¾ mile of single track, beginning at Third Avenue and Pine Street and running in a northerly direction to Thirteenth Avenue West and Nickerson Street. The other line, Division "C," was a gift to the city by real estate speculators who, finding the property a heavy financial burden, offered it to the city as a gift. The road cost \$125,000, is approximately 8½ miles long, with 4½ miles within the city limits and 4 miles outside, runs in a southerly direction beginning at Spokane Avenue and Iowa Street, and ends at Seahurst. The lines are widely separated—about 3 miles apart, and in opposite parts of the city—one in the south and the other in the north end.

The miscellaneous receipts of Division "A" in the above table represent simply accrued book accounts for the rental of cars by Division "A" to Division "C," no cash being involved. During the year Division "A" carried 339,611 pay passengers and Division "C" 305,495, or a total of 645,106. The passenger car miles totaled 168,452 for Division "A" and 143,942 for Division "C," while the freight car miles numbered 4 328 on Division "C." The earnings per car mile were \$0.1056 on Division "A" for passenger service and \$0.1101 on Division "C" for passenger service and \$0.4161 for freight service, while the operating expenses per car mile were \$0.1388 on Division "A" for passenger service and \$0.1541 on Division "C" for passenger service and \$0.1820 for freight service.

The loss of \$24,421 for the year is exclusive of interest on borrowed funds, depreciation, taxes, damages, overhead charges of any kind, as well as accounting, superintendence and legal expenses. As showing what a small part of the loss suffered by the community through the operation of the railways is included in this figure, it has been estimated that exclusive of charges for superintendence, accounting, legal insurance or damage expenses, the charges for taxes, depreciation and interest on borrowed funds alone would amount as follows:

Interest at 4½ per cent on \$90,000 borrowed from garbage fund	\$4,050
Interest at 4½ per cent on \$9,000 borrowed from general fund for operation.....	405
Interest at 4½ per cent on \$27,500 borrowed from general fund to rehabilitate Division "C".....	1,224
Interest at 4½ per cent on \$10,000 borrowed from general fund for operation (three months).....	113
Depreciation at 4 per cent on \$403,000 plant cost Division "A".....	16,120
Depreciation at 4 per cent on \$156,000 plant cost Division "C".....	6,240
Lost taxes, Division "A," on 45 per cent valuation.....	7,435
Lost taxes, Division "C," on 45 per cent valuation.....	2,878
Loss 2 per cent on gross passenger receipts.....	612
Total	\$39,077

Alabama Traction, Light & Power Company, Ltd.

The statement of income, profit and loss of the Alabama Traction, Light & Power Company, Ltd., New York, N. Y., for the year ended Dec. 31, 1914, is as follows after eliminating inter-company items:

Operating revenues:	
Light and power department.....	\$513,234
Railway department	94,463
Gas department	45,358
Water department	4,539
Total	\$657,594
Deduct:	
Rebates and discounts.....	\$35,137
Reserve for bad debts.....	2,679
Total	\$37,816
Net operating revenue.....	\$619,778
Operating expenses:	
Light and power department.....	\$217,577
Railway department	71,841
Gas department	27,665
Water department	5,209
General expense	1,000
Total	\$323,292
Net operating income.....	\$296,486
Add interest on deposits.....	3,070
Gross income before deducting bond interest and depreciation	\$299,556

The war in Europe has resulted in a general business depression far more severe than any which had previously existed. As a direct consequence it has been impossible to secure new power business on the scale anticipated, and at the close of the year the company's revenue was very considerably short of the amount necessary to cover fixed charges and operating expenses.

At the outbreak of the war tentative arrangements which had been made in London for the further financial requirements of the company could not be consummated. In London on Oct. 21, 1914, about 75 per cent of the bondholders agreed to defer for three years the bond interest due on Sept. 1, 1914, and March 1, 1915; to cancel the obligations contained in the trust deed to provide a sinking fund for the repayment of the bonds, and to authorize any of the subsidiary companies to issue bonds or debentures in the nature of prior lien securities under certain restrictions.

The directors deemed it advisable to arrange for an issue of bonds of the Alabama Power Company, the principal operating company, and in connection with such issue to merge all the subsidiary companies into the Alabama Power Company. This merger was effected and arrangements were closed early in March, 1915, for the sale of \$2,000,000 of three-year 6 per cent gold bonds to Harris, Forbes & Company, New York. The sale of the new securities enabled the company to liquidate all its obligations and to proceed vigorously with extensions.

ENGLISH LINES SHOW VARIED RESULTS

The London County Councils Tramway, London, England, had a deficit for the year ended March 31, 1915, after all charges, of £33,172. Passengers carried numbered 550,497,993 as compared with 522,952,640 in the preceding year. The total income for the year was £2,399,847 and operating expenses, including the war allowance to employees on active service, were £1,700,571, leaving net of £699,276. Car-miles operated during the year were 58,978,792 and the cost per car-mile of the electric railways, excluding war allowances, was 13 cents. Including war allowances, this cost was 13.6 cents a car-mile. The receipts on the electric lines were 19.4 cents a car-mile, as compared with 18 cents a car-mile for the preceding year. Up to March 31, 1915, capital expenditures on the lines had been £13,315,723, of which £287,604 was expended in the fiscal year.

The committee in charge of the tramways is taking steps to improve the financial position of the undertaking and attaches great importance to the consolidation and the linking up of the lines, a matter which has been held in abeyance for the present. The committee states that the conditions under which the undertaking has been worked since the outbreak of the war have been abnormal, producing results not fairly comparable with results under

normal conditions. During the first four months of the financial year the tramways were worked under normal conditions, the results being satisfactory. The receipts from April 1 to Aug. 5, 1914, were about 5½ per cent more than the receipts for the corresponding period of 1913.

The effect of the war on the Manchester (England) Corporation Tramways was to reduce the revenue for the last year by £23,434. The total for the year ended March 31 was £901,875, as compared to £925,309 in the previous year. This decrease was caused by the great falling off in the traffic receipts since the outbreak of the war. If normal conditions had prevailed throughout the year the traffic receipts, instead of showing a decrease, would, according to the annual report issued, have shown a considerable increase. The receipts for the first four months clearly indicated this, and there is no doubt that but for the war the estimate of the revenue (£950,600) made at the beginning of the financial year would have been realized. The effect of the war, therefore, has been to cause a drop in revenue of nearly £50,000.

Considerable savings were made in the operating expenses as compared with last year, but the total expenditure was largely increased by the war service allowances (£31,763), representing mainly the payments made to the 1554 men who had joined the colors up to the close of the financial year. The net result shows that after paying the £100,000 in relief of the rates it was possible to pay only £48,584 to the reserve renewals and depreciation account, as compared to £97,219 paid to this account last year.

The total revenue of the Leeds Municipal Tramways for the year ended March 31 was £422,353, an increase of £6,312 over that for the previous year. Operating expenses being deducted left a net revenue of £200,310, as against £195,730 in the previous year. The working expenses are approximately 53 per cent of the total revenue. After deducting the interest paid on capital, income tax, rent on lines and war allowances to dependents of those employees on active service, there was left a balance to be carried to the appropriation account of £147,479, which compares with £151,735 in the preceding year.

The amount to be set aside for depreciation was £56,230; and with further deducting the cost of upkeep of permanent way and electrical renewals, there was left a net surplus of £79,389, available for the relief of the rates. This is the largest amount ever applied from this undertaking to the relief of the Leeds rates. Prior to the outbreak of the war it was estimated that the relief would amount to £92,463, but the first ten weeks after the war began showed a reduction in revenue of £6,800, while war payments to employees' dependents represent an annual sum of £4,340.

WEST VIRGINIA MERGER RUMORED.

The visit of a party of West Virginia traction officials and Eastern bankers to various traction systems of the state has led to the rumor that a gigantic traction merger is planned to give a continuous trolley system through the interior of the state, reaching almost from border to border. The rumored merger would mean the amalgamation of the Monongahela Valley Traction Company, the Weston-Glenville Traction Company, the Kanawha Traction & Electric Company and possibly the Parkersburg and Charleston systems and the construction of connecting links.

The bankers and traction officials are traveling in automobiles from the southern terminal of the Monongahela Valley Traction Company's system at Weston by way of Glenville and Burnsville to Parkersburg and Charleston. Among those in the party are George T. Watson, Fairmont, vice president Consolidation Coal Company; James O. Watson, Fairmont, general manager Monongahela Valley Traction Company; S. D. Camden, Parkersburg, president Parkersburg, Marietta & Interurban Railway; T. Edward Hamilton, president Hamilton Banking Company, Baltimore, Md., and R. C. Hoffman, of the Pennsylvania Steel Company, Philadelphia, Pa.

American Public Utilities Company, Grand Rapids, Mich.—At the annual meeting of American Public Utilities Company Walter H. Lippincott was elected a director to succeed Henry S. Morris, Philadelphia.

Buffalo (N. Y.) Southern Railway.—At a recent meeting of stockholders William A. Bundy and Charles B. Pheller, Buffalo; David K. Harrington, Orchard Park, and John J. Roberts, New York, were elected directors of the Buffalo Southern Railway.

Brantford (Ont.) Municipal Railway.—The Brantford Municipal Railway after six months of operation has earned sufficient to cover the operating expenses and leave a balance of \$8,284. After payment of local taxes and fixed charges, however, there is a net deficit of \$3,438. The commission hopes that the system will pick up within a year, when Mohawk Park is improved and a loop line in Eagle Place taps the factories of the city, which have hitherto not been reached.

Everett Railway, Light & Water Company, Everett, Wash.—An election was to be held on Aug. 24 on the question of issuing \$1,100,000 of 6 per cent bonds, the proceeds of which it is proposed to use for financing the purchase or the condemnation and purchase of the plant belonging to the Everett Water Company, which is owned by the Everett Railway, Light & Water Company.

Fort Wayne & Springfield Traction Company, Decatur, Ind.—At a receiver's sale on Aug. 12 the Fort Wayne & Springfield Traction Company was bid in by Martin Gerke for Mrs. Rosetta Dirkson and Mrs. Emma Gere, who represent an organization of the old stockholders. It is reported that these stockholders have organized the Fort Wayne, Decatur & Southern Traction Company to operate the line. The sale price was \$78,000, a deposit of \$5,000 having been required of all bidders. The buyers have sixty days to pay the balance. It was the fifth time the road had been offered for sale and the second time it was sold. Last May the same persons bid in the road for \$84,000, but failed to make the required payments, forfeiting a deposit of \$1,000. The sale is expected to be confirmed at once by the Circuit Court. Previous references to this company were made in the *ELECTRIC RAILWAY JOURNAL* of May 13 and 22, June 19 and July 31.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The Los Angeles & San Diego Beach Railway has filed with the California Railroad Commission an application for authority to issue a \$15,000 note for four months at 6 per cent to the American National Bank, San Diego, to renew a similar note. The proceeds were spent for betterments to the railway.

Philadelphia Company, Pittsburgh, Pa.—The Duquesne Light Company, which is controlled by the Philadelphia Company, recently issued \$1,000,000 of additional 7 per cent cumulative preferred stock. The company now has \$1,700,000 of such stock outstanding.

San Francisco (Cal.) Municipal Railways.—The gross receipts of the San Francisco Municipal Railways for July were \$221,337. This averages \$7,140 per day and is the heaviest gross return in any one month since the system has been operating.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The suit brought by the Anglo-California Trust Company, San Francisco, against the United Properties Company and other stockholders of the Oakland Railways, as noted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 21, for recovery on the issue of \$2,500,000 of Oakland Railways notes of Aug. 12, 1912, is said to have been made to protect the noteholders in the event that the pending reorganization of the San Francisco-Oakland Terminal Railways, which controls the Oakland Railways and is in turn controlled by the United Properties Company, is not carried out. It is said that the statute of limitations would have made the trust company unable to sue after Aug. 15. The California Railroad Commission has issued a supplemental opinion in the application of the San Francisco-Oakland Terminal Railways for authority to pledge with the Commonwealth Bonding & Casualty Insurance Company \$18,000 face value of its general lien mortgage bonds and \$40,000 face value of the same bonds as security for surety bonds in connection with damage suits.

Seattle, Renton & Southern Railway, Seattle, Wash.—The Supreme Court, in modifying an order entered some months ago by Judge A. W. Frater in the Superior Court, states that Peabody-Houghteling & Company, who are

interested in the Seattle, Renton & Southern Railway, are entitled to interest as well as the full amount of the loans made to the local company. The claim was that of a general creditor and rested upon notes given from time to time in exchange for loans. The lower court declined to allow interest, as noted in the ELECTRIC RAILWAY JOURNAL of Feb. 13, 1915, but the Supreme Court has ruled that it must also be paid. The court has also affirmed the decision of Judge Frater making preferred the claim of Augustus H. Peabody, trustee for the holders of \$1,000,000 bonds of the railway.

Southern Traction Company of Illinois, East St. Louis, Ill.—A suit to determine the various interests of claimants against the property of the Southern Traction Company of Illinois has been filed in the United States Court at Danville. The action is brought by the Union Trust Company & Savings Bank, St. Louis, Mo., trustee for the original bondholders. The line was partially constructed for 15 miles near St. Louis, by former United States Senator William Lorimer.

Syracuse & South Bay Electric Railroad, Syracuse, N. Y.—On account of unexpected and unavoidable delays of a routine nature, it is said that the foreclosure sales of the Syracuse & South Bay Electric Railroad and the Syracuse, Watertown & St. Lawrence River Railroad will not be possible until the latter part of October or early in November. Previous references to these companies were made in the issues of the ELECTRIC RAILWAY JOURNAL of May 29 and June 19.

Toronto (Ont.) Railway.—Seventy-nine 4½ per cent currency bonds, par \$1,000, and 305 sterling bonds, par £100, issued under the first mortgage dated Sept. 1, 1892, have been drawn for redemption at par and interest on Aug. 31 by the Toronto Railway.

Union Traction Company, Santa Cruz, Cal.—A meeting of bondholders of the Union Traction Company was scheduled for Aug. 25 to investigate the condition of the corporation through the appointment of a committee of bondholders. Owing to the prevalence of the auto habit, the gross earnings of the company fell off from \$82,000 during the year ended June 30, 1914, to \$69,377 in the last fiscal year. The deficit for the year just ended was \$11,116. An amount of \$23,636 was on June 30 due to the Coast Counties Gas & Electric Company, which owns the Union Traction Company stock but has not guaranteed any of its obligations.

United Railroads of San Francisco, San Francisco, Cal.—The California Railroad Commission has extended the effective date of its order of May 17, requiring the United Railroads of San Francisco to set aside \$550,000 a year for three years for betterments, until such time as the commission has denied or granted the petition for a rehearing that has been filed by the company. The company protested that it was impossible for it to comply with the order.

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.—Up to the close of business on Aug. 17 stockholders had subscribed for \$18,237,000 of new convertible bonds from the \$18,695,000 offered for subscription at 105. Under the terms of the agreement the unsubscribed bonds, \$485,000, will go to the holders of the old bonds. Of the total subscriptions payment was made in full for \$16,423,000 of bonds. On the balance the first installment was paid. The conversion plan, which was declared operative by Kuhn, Loeb & Company in July, was described in the ELECTRIC RAILWAY JOURNAL of May 8.

Winnipeg (Man.) Electric Railway.—The Winnipeg Electric Railway has applied to the London Stock Exchange for the listing of £400,000 of 4½ per cent perpetual consolidated debenture stock. This makes a total listed of £900,000.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—The gross earnings of the Youngstown & Ohio River Railroad during the year ended June 30, 1915, totaled \$290,164, as compared to \$273,603 for the preceding year. The operating expenses, taxes and rentals increased from \$175,678 in 1914 to \$185,674 in 1915, giving net earnings of \$97,925 in 1914 and \$104,490 in 1915. The bond interest each year amounted to \$50,000, so that the surplus for the last fiscal year was \$54,490 as compared to \$47,925 in 1914.

DIVIDENDS DECLARED

Louisville (Ky.) Traction Company, 2½ per cent, preferred; quarterly, 1 per cent, common.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, KENNEBUNK, ME.

Period	Operating Revenues	Operating Expenses	Operating Income	Fixed Charges	Net Income
1m., July, '15	\$44,197	\$35,006	\$9,191	\$654	\$8,537
1 " " '14	49,184	27,948	21,236	667	20,569

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

1m., Jun., '15	\$163,746	\$123,865	\$39,881	\$33,625	\$6,256
1 " " '14	192,559	118,152	74,407	38,816	35,591
12 " " '15	1,982,599	1,299,352	683,247	472,112	211,135
12 " " '14	2,113,082	1,337,587	775,495	459,075	316,420

BATON ROUGE (LA.) ELECTRIC COMPANY

1m., Jun., '15	\$15,409	*\$8,967	\$6,442	\$1,736	\$4,706
1 " " '14	15,603	*9,590	6,013	1,727	4,286
12 " " '15	180,955	*110,823	70,132	20,765	49,367
12 " " '14	175,937	*114,882	61,055	21,154	39,901

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

1m., Jun., '15	\$10,420	*\$7,960	\$2,460	\$1,123	\$1,337
1 " " '14	11,458	*8,870	2,588	1,085	1,503
12 " " '15	118,966	*98,844	20,122	13,463	6,659
12 " " '14	121,731	*102,208	19,523	12,868	6,655

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.

1m., Jun., '15	\$27,832	*\$17,856	\$9,976	\$6,597	\$3,382
1 " " '14	29,697	*17,595	12,102	6,418	5,684
12 " " '15	338,169	*208,227	129,942	78,608	51,334
12 " " '14	373,646	*207,338	166,308	75,253	91,055

CITIES SERVICE COMPANY, NEW YORK, N. Y.

1m., Jun., '15	\$294,520	\$14,022	\$280,497	\$40,333	\$239,664
1 " " '14	269,586	8,947	260,639	29,166	231,473
12 " " '15	3,977,733	148,170	3,829,562	490,000	3,339,562
12 " " '14	3,399,186	90,984	3,308,202	298,062	3,010,140

COLUMBUS (GA.) ELECTRIC COMPANY

1m., Jun., '15	\$56,286	*\$27,079	\$29,207	\$25,332	\$3,875
1 " " '14	54,120	*20,797	33,323	23,141	10,182
12 " " '15	696,498	*318,140	378,358	305,871	72,487
12 " " '14	646,505	*274,091	372,414	259,292	113,122

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

1m., Jun., '15	\$58,584	*\$31,324	\$27,259	\$8,713	\$18,546
1 " " '14	58,250	*34,201	24,049	8,351	15,698
12 " " '15	672,517	*385,290	287,227	104,566	182,661
12 " " '14	602,878	*381,390	221,488	99,695	114,328

EL PASO (TEX.) ELECTRIC COMPANY

1m., Jun., '15	\$72,931	*\$40,496	\$32,435	\$4,194	\$28,241
1 " " '14	80,052	*49,849	30,203	4,203	26,000
12 " " '15	997,414	*540,820	456,594	50,328	406,266
12 " " '14	963,471	*532,768	430,703	54,653	382,741

HOUGHTON COUNTY TRACTION COMPANY, HOUGHTON, MICH.

1m., Jun., '15	\$24,589	*\$14,070	\$10,519	\$5,661	\$4,958
1 " " '14	24,508	*16,610	7,898	5,552	2,346
12 " " '15	265,299	*168,279	97,020	67,041	29,979
12 " " '14	288,369	*179,649	108,720	67,140	41,580

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Jun., '15	\$21,770	*\$13,836	\$7,934	\$6,595	\$1,339
1 " " '14	24,613	*16,273	8,340	6,623	1,717
12 " " '15	292,513	*186,460	106,053	80,914	25,139
12 " " '14	308,017	*196,514	111,503	80,598	30,905

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Jun., '15	\$21,511	*\$11,745	\$9,766	\$7,137	\$2,629
1 " " '14	24,364	*14,869	9,495	7,138	2,357
12 " " '15	248,544	*153,340	95,204	86,987	8,217
12 " " '14	285,662	*179,361	107,301	85,708	21,593

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., July, '15	\$1,939,905	\$1,095,694	\$844,211	\$816,595	\$27,615
1 " " '14	1,951,265	1,137,700	813,563	809,364	4,199

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Jun., '15	\$592,736	*\$382,357	\$210,379	\$181,342	\$29,037
1 " " '14	668,255	*413,509	254,745	176,661	78,084
12 " " '15	7,908,397	*4,825,817	3,082,579	2,151,772	930,807
12 " " '14	8,701,960	*5,059,171	3,642,788	2,096,613	1,546,175

TAMPA (FLA.) ELECTRIC COMPANY

1m., Jun., '15	\$77,004	*\$41,898	\$35,106	\$3,631	\$31,475
1 " " '14	81,685	*44,012	37,673	3,700	33,973
12 " " '15	986,799	*507,366	479,433	43,863	435,570
12 " " '14	933,560	*514,778	418,782	46,580	372,202

*Includes taxes. †Includes non-operating income.

Traffic and Transportation

JITNEY JOTTINGS

Public Service Commission and Court Action in New York on Jitney

The Public Service Commission for the Second District of New York, in addition to the court action taken recently to restrain the operation of jitney-bus lines in Rochester and Corning which have not secured certificates of public convenience and necessity, has instituted upon the complaint of the New York State Railways and the Corning & Painted Post Street Railway action against three jitney operators in Corning and seven in Rochester. These proceedings will be before the commission itself. The complainants allege that the jitney men are operating in violation of the law passed at the last session of the Legislature by carrying passengers within a city of the State for 5 cents and in competition with a common carrier, and invoke the power of the commission to stop them. The complaints have been served on the various jitney men, and upon receipt of their answers dates for hearings will be set by the commission.

Both the street railways allege that their business is being injured by the operation of these vehicles contrary to law, and claim the same protection from the Public Service Commission as might be afforded to an individual. The hearings before the commission will amount to a trial of the issue as to whether or not the jitneys are violating the law. Should it be proved that they are, the commission is empowered to take legal steps to prevent their operation.

In addition to the cases mentioned, the commission also has in the correspondence stage a number of similar matters from cities all over the State, in some instances originating with citizens and in others with street railways. As yet there has been but one formal application to the commission for a certificate of public convenience and necessity for the operation of a jitney line. This came from the Troy Auto Car Company, but was withdrawn in order that the proprietors of the line might make some changes in their incorporation. As rapidly as formal complaints are made the commission, according to its established procedure in all cases, serves the complaint on the alleged offender, and after giving him an opportunity to answer tries the issues which may thus be joined. The complaints served on Aug. 20 in the Rochester and Corning cases are the first which have been made formal.

The motor-bus service between Lockport, N. Y., and Olcott Beach on Lake Ontario, a distance of 12 miles, for which a fare of 50 cents was charged, was dealt a death blow by Justice Brown in the Special Term of the Supreme Court in Buffalo, N. Y., in an opinion handed down, in which the justice held that the owners of the line must get a certificate of necessity and convenience from the New York State Public Service Commission, Second District, and a permit from the City Council of Lockport. The court granted an injunction restraining Mr. Hurtgan from operating his motor vehicles and carrying passengers for hire in Lockport. Burt G. Hurtgan, Newfane, owned the line. Arguing before the court, counsel for the defendant claimed that he did not collect fares between points in Lockport nor did he discharge passengers anywhere within the city limits, but merely operated a bus line between two points in the State over a state highway, not in violation of any law and not under the jurisdiction of any commission or law-governing body. Representatives of the International Railway, who filed the complaint against the jitney service, held the line was in competition with the railway and ran parallel to its right-of-way for miles. The court held the service was under the jurisdiction of the Thompson law passed last winter.

The jitney situation in Philadelphia has undergone such rapid changes during the week that overnight developments have cut the number of cars operating on Broad Street from 1200 to eight. This was the result of the police department enforcing the ordinance regulating jitneys. Drivers who had threatened to run the police gauntlet and risk arrest underwent a change of heart. Three unbonded drivers who operated were arrested. One of them was released because

he told Magistrate Beaton in City Hall that he operated from a fixed stand and charged more than 5 cents for a ride. The other two were discharged when they explained that they operated large machines and came under the provisions of the omnibus bill of 1907 by carrying thirty or more passengers.

That all the Philadelphia jitney ordinance is in force excepting that part of one section requiring the jitneys to travel over the whole of prescribed routes for a fare of 5 cents; that to make "sight-seeing" cars out of jitneys would be evading the law, and that the \$2,500 bond required for each car operating as a jitney was prepared in accordance with the ordinance were declared to be the facts in an opinion given by City Solicitor Ryan to Director of Public Safety Porter. In his opinion Mr. Ryan said: "In connection with the general jitney question, I would suggest that neither you nor I have any power to alter or amend the terms and provisions of the ordinance in relation to the duties devolved upon us respectively by it, without regard to our private opinions on the subject."

The first section of the ordinance specifically exempts "any street railway car or motor-propelled vehicle used exclusively for sightseeing purposes." Mr. Ryan held that under this exemption any vehicle which is in good faith used genuinely for what are known as sightseeing purposes at the time of the passage of the ordinance should be permitted to run without reference to the requirements which the ordinance contains.

In Gloucester City, N. J., an ordinance regulating jitneys has been passed by Councils, fixing the license fee at \$20 for each car having a seating capacity of four, \$25 for a car having a capacity of five, \$30 for those of six, and increasing by \$5 per person up to \$50 for machines carrying ten persons. The license fee applies to both residents and non-residents.

I. M. Howell, Secretary of State of Washington, reports that since the jitney bus-bonding law, passed by the 1915 Legislature, went into effect on April 1 911 jitney buses have been bonded in first-class cities of the State. Of this number eighty-three have been cancelled or surrendered, leaving 828 jitney buses operating on Aug. 15. The cities affected by the jitney bus law are Seattle, Tacoma, Spokane, Bellingham and Everett. The law provides for a bond of \$2,500 for each jitney operating in a first-class city. The figures of Mr. Howell show that most of the withdrawals have come from Spokane, due no doubt to stringent municipal regulation, as compared with the ordinances regulating buses in Seattle and Tacoma. In Spokane eighty-eight jitneys have been bonded, but of this number twenty-two have surrendered their permits. In Seattle 628 permits have been issued. Of this number forty-five have been surrendered, leaving a total of 583 still operating. Surrender of the bonds and permit has been made either at the request of the bonding company or the jitney-bus operator himself. In the former instance the bondsman has asked to be relieved of the risk, while in the latter the operator has found a more lucrative field of endeavor in another city or has retired from the business. The complete figures are as follows: Seattle, permits, 628; cancelled, 45; net, 583. Tacoma, permits, 144; cancelled, 13; net, 131. Spokane, permits 88; cancelled, 22; net, 66. Everett, permits, 39; cancelled, 3; net, 36. Bellingham, permits, 12; cancelled, none; net, 12.

The Common Council of Lansing, Mich., has passed a regulatory ordinance governing jitney buses by which they must pay a license fee of \$26 annually and provide a bond of \$10,000 as a protection for passengers. The jitney bus men threaten court action to prevent enforcement of the ordinance. Considerable feeling exists against the jitney men because after the cars stop running at night they boost their fare to 10 cents.

The city of Los Angeles, Cal., on Aug. 5 paid to the secretary of the Auto-Bus Owners' & Operators' Association \$4,000 as refund on excess jitney bus license fees received by the city. Other similar claims are pending.

The city ordinance of Austin, Tex., regulating the jitneys was held void and of no effect by District Judge A. S. Fisher in the N. C. Partin habeas corpus proceedings that grew out of opposition on the part of the jitney men to the ordinance. The court holds the attempt of the city to define certain cars

as jitneys to be in violation of constitutional rights. It holds that the city has the power to license automobiles, but not to discriminate between service automobiles. Calling certain cars jitneys gives the city no right to impose a heavy tax upon them. The right of the city to control the street is upheld. Referring to the I. W. Sullivan case, in which case the Court of Criminal Appeals upheld the Fort Worth jitney ordinance, Judge Fisher ruled that, that where cases are similar it is the duty of the lower court to follow the higher court's ruling, but where the facts are not similar and there has been no ruling by the higher court, investigation and ruling in a case are within the right of the lower court. Judge Fisher ruled that the case of Partin was different in some of its particulars from the so-called Sullivan case.

Injunction against operators of some 300 jitney buses in Memphis, Tenn., having been denied the Memphis Street Railway in the local courts, an appeal has been taken to the State Supreme Court. An effort will be made to have the case argued before the sitting of the court at Knoxville in September. The street railway case does not involve the question of the constitutionality of the State law, which provides that municipal authorities may require \$5,000 indemnity bonds. This, however, has been raised in other cases now before the Supreme Court. In Memphis such an ordinance was prepared but has not been made effective, pending decision of the question.

The Quincy (Ill.) Street Railway has filed a petition with the State Public Utilities Commission of Illinois for the regulation of jitney buses in that city. The company desires that the jitneys be restrained from operating on the streets on which there are street cars. The date for the hearing has not been set.

The jitney bus ordinance was passed by the City Commission of Springfield, Ill., on Aug. 10. The ordinance provides for a bond of \$5,000 for cars carrying five or less passengers and an additional bond of \$500 for each additional passenger capacity. Before the new ordinance was read Commissioner Reece was given leave to withdraw the original ordinance, which has been slumbering in committee. The substitute provides that the following licenses shall be paid each year: For cars carrying five passengers, \$5; cars carrying from five to eight passengers, \$7; cars carrying from eight to ten passengers, \$10; cars carrying more than ten passengers, \$25. The license shall be paid October 1. Drivers of cars engaged in jitney service must secure a permit from the Mayor and Commission on payment of a fee of 50 cents, and are to be provided with a numbered badge, and the age for drivers is from eighteen to sixty years. Owners of cars who apply for licenses will be compelled to certify the route over which they are to drive. This section of the ordinance was opposed by the owners at a recent hearing, upon the ground that the enforcement of this section would make the cars common carriers and place them under the jurisdiction of the State Utilities Commission. Terminals will be established, but must be outside of the zone bounded on the north by Madison Street, the south by Capitol Avenue, the west by Second Street and the east by Eighth Street. Cars are allowed to stop for a period of not to exceed five minutes at crossings, and cars must be brought to standstill not less than 70 ft. from the crossing intersection. The cars are to be operated for at least six hours a day. Violation of the ordinance is punishable by a fine of not less than \$5 or more than \$200, and conviction may also bring automatically the revocation of the license. The ordinance will go into effect thirty days after its passage.

The Jitney Service Company, Williamsport, Pa., has requested the Public Service Commission for permission to withdraw its request for a certificate approving its incorporation. The reason stated is that the business of the jitneys in Williamsport has fallen so much that it was not deemed to be expedient to make further expenditures at this time.

In upholding an ordinance enacted by the Council of Independence, Judge Foran of Cleveland, Ohio, said that jitney bus owners must be required to give continuous service at regular intervals and must bear a portion of the taxes. He also suggested a \$10,000 bond and license fees. The court said that the jitney bus should be fostered within all reasonable limitations.

WISCONSIN JITNEY LAW

Summary of Provisions of Recent Measure Placing Jitneys Under the Jurisdiction of the Railroad Commission

The Governor of Wisconsin on Aug. 17 approved chapter 546 of the laws of 1915 relating to the operation of motor vehicles for the carriage of passengers for hire upon streets and highways. Except for two sections the act took effect upon passage and the measure in its entirety will go in effect on Sept. 1, 1915. The measure declares as a common carrier every motor vehicle affording a means of local street or highway transportation similar to that furnished by street railways and indiscriminately accepting and discharging passengers. Such vehicles are required to operate over such general routes or within such territory and during such hours as may be reasonably required for the accommodation of the public in accordance with the provisions of the measure. No vehicle is to be operated in passenger transportation unless there has been filed with and accepted by the Railroad Commission an indemnity bond issued by a security or indemnity company authorized to transact business in Wisconsin, and the bond must provide that the company issuing it shall pay all damages not exceeding \$2,500 to any one person or \$5,000 for any one accident resulting from the negligent use of the automobile. Applicants for permission to operate in Wisconsin must state their name and residence, the general route or the territory over which it is proposed to operate, the proposed hours of service and the rate of fare to be charged. Regarding the authority of the commission the law says:

"If the railroad commission shall determine that such bond complies with the provisions of section 1797-63 and that the rates specified in the application accompanying the same are reasonable for such character of service, and that the proposed general route, or territory to be covered, and the hours of such operation are reasonably adapted to the accommodation of the public, it shall, regardless of any other service now furnished, accept such bond and shall thereupon issue to such applicant a certificate setting forth the fact that the applicant has in respect to the vehicle described therein complied with the provisions of section 1797-63 and section 1797-64."

Any person who operates a motor vehicle in contravention of the provisions of the section of the law governing bonding, who transports in any vehicle a larger number of passengers than the number specified in the bond as the carrying capacity of the vehicle, who charges a rate of fare other than that prescribed in the application accompanying the bond, or who fails to operate the vehicle upon the general route or within the territory and during the hours set forth in his application, is to be deemed guilty of a misdemeanor and upon conviction be fined not less than \$10 nor more than \$100 for each offense and in default thereof may be committed to the county jail for not less than ten nor more than ninety days. Every city, village and town within or through which any motor vehicle is operated for public hire may require local consent for operation and as a condition of such consent may require reasonable compensation for the repair and maintenance of pavement and bridges and compensation for the regulation of street traffic and for any other expenses occasioned by the operation of the automobile.

LIMITS FIXED FOR PARCELS ON NEW YORK CARS

The Public Service Commission for the First District of New York has adopted a final order establishing rules and regulations to govern the carrying of parcels and newspapers upon the subway and elevated lines operated by the Interborough Rapid Transit Company, and upon the subway and elevated lines of the New York Consolidated Railroad Company, the Nassau Electric Railroad and the South Brooklyn Railway.

The regulations governing the Interborough Rapid Transit Company's lines allow the carrying of newspaper bundles in the rush hours under certain restrictions, prohibit the sorting of papers on the cars and the throwing of packages from the trains. In non-rush hours the restrictions are not as stringent. As to parcels other than newspaper bundles, passengers will not be allowed to enter any station with

bulky baskets or bundles, but only with ordinary hand satchels and parcels that can be conveniently carried on their laps or under seats without inconvenience to other passengers. No inflammable material will be admitted.

The regulations on the other lines permit the carrying of bundles of newspapers upon the platforms of elevated trains, but not inside the cars except between the hours of 2 a. m. and 6 a. m. Such bundles will be carried, subject to certain restrictions, which are formulated in the regulations. Passengers will not be allowed to carry very long or bulky articles or packages which are likely to cause accidents or serious inconvenience to other passengers. All articles which the guard thinks may be carried without danger or inconvenience and which are too large to be carried on the inside of the car, including bass drums and other articles for which special permits have been issued, must be kept on the platform in the custody of the owner.

All companies have been notified to file an amendment to their passenger tariff schedules to conform with the regulations. The proceedings which brought about the order were begun last May, after several persons with large bundles had been denied access to the subway and had complained to the commission. The Publishers' Association has already given its sanction to the order so far as it applies to newspaper bundles.

NEW TRAFFIC REGULATIONS PROPOSED

As a result of numerous investigations of street accidents involving automobiles and horse-drawn vehicles, extending over a period of several months the street traffic committee of the Safety First Society of the City of New York, has approved reports recommending new regulations, which it is believed will tend to minimize the number of preventable accidents occurring upon the public streets. The following recommendations, approved by the street traffic committee have been referred to William Bondy, general counsel of the society, with instructions to prepare the necessary ordinances for early introduction in the Board of Aldermen.

1. A new ordinance to provide for the elimination of dazzling head and side lights.
2. An ordinance requiring parallel parking at the curb for all vehicles of the delivery type.
3. An ordinance requiring the use of mirrorscopes on all motor vehicles operated in Greater New York. (New Jersey now requires the use of mirrorscopes.)
4. An ordinance requiring owners of all motor vehicles with chain drive to inclose the chains with suitable guards.
5. An ordinance making it a misdemeanor for any person to "hitch on" or trespass upon a motor truck or horse-drawn vehicle, unless employed by the owner of such vehicle.
6. An ordinance requiring that when a motor vehicle is at a stand-still and unattended, the vehicle shall be safeguarded as follows: (a) The motor of a gasoline propelled vehicle must be stopped; (b) on electric motor vehicles the control handle or the current cut-off switch must be locked so that the vehicle is rendered inoperative; (c) on all steam-propelled motor vehicles, the throttle or shut-off valve must be locked so as to render the vehicle inoperative; (d) the emergency brakes on a motor vehicle must be properly set so as to prevent such vehicle from moving.

The police department has been requested immediately to enforce the 8-ft. leeway law, the ordinance requiring lights on all vehicles. Among the members of the street traffic committee of the Safety First Society of the city of New York are George Keegan, general superintendent of transportation of the New York Railways, and J. A. Ritchie of the Interborough Rapid Transit Company.

SHOWING THE FARMER

A recent bulletin from the bureau of crop estimates of the Federal Department of Agriculture is in line with the argument which R. H. Wyatt, general freight agent of the Louisville & Interurban Railway, Louisville, Ky., has been presenting to the farmer patrons of the lines. One of the important features of the bulletin, which contains the findings of an investigation, is the statement that the average length of haul for the farmer who takes his produce to market by wagon is 6.5 miles, while the average time required to make the circuit is slightly more than half a day. For those farmers who are located beyond the normal radius

from their markets, not including the extreme cases, the average haul has been found to be 8.7 miles and the average time to make the circuit is three-fourths of a day.

Mr. Wyatt, discussing the proposition from the viewpoint of the Louisville & Interurban Railway, took the average figures, 6.5 miles and a half a day in time, and estimated that this represented a cost in time of man and team of at least \$2.50 on the average, of course, figuring that no team owner would sell services of man, team and wagon for less, while the average cost for hauling produce from all points on the company's lines to the freight depot, where the commission men would get it, he figured at between 50 and 75 cents a load. The commission man's charges would hardly be more than 50 cents on the average load, which would give the farmer a margin of between \$1.50 and \$1.25, out of which the costs of his delivery to the electric line would have to come, of course. But Mr. Wyatt figures it as a probability that the commission merchant's superior salesmanship and greater familiarity with the market would enable him to sell the produce to better advantage.

Two of the drawbacks to increasing the volume of this farm-to-market business, Mr. Wyatt said, are the distrust of the commission man by the farmer and the fact that the farmer has not been educated up to figuring comparative costs. Both of these are things the electric railway people will have to overcome before they will make much progress in taking over this farm-to-market business, Mr. Wyatt believes. His own propaganda along the line that the farmer's time in his fields is much more valuable to him, especially during the growing season, than it is on the road or in the market, is bearing fruit, and Mr. Wyatt is frequently asked for his reasoning on the proposition by producers along the lines of the company.

Gorge Lines Inspected.—The members of the Municipal Board of the Province of Ontario, with directors and engineers of the International Railway, Buffalo, N. Y., have inspected the Canadian line of the Great Gorge Route along the brink of the gorge and in the vicinity of the recent accident. The board will make a report as to suggested changes in equipment. The Attorney-General of the Ontario province will not take any action until after the report has been filed.

Skip-Stop Rejected in Newark.—The Board of Works of Newark, N. J., has disapproved the plan for skip-stops within the city proposed on behalf of Verona and other places near Newark. The motion that the board should not agree to any skip-stop was carried with the comment that the citizens of Newark should not be deprived of any transportation accommodations to which they were entitled. Residents of Verona, Montclair, Bloomfield, Glen Ridge and Caldwell are said to be considering a plan for the operation of a skip-stop service by the Public Service Railway in these places.

"Near-Side" Stop Agitation in Denver.—The "near-side" stop has come up as a subject of controversy in Denver, Col. The Denver Tramway is trying to secure an expression of opinion from the people, and has published a pamphlet to inform its patrons before they make a decision. A vote is to be held to see whether a "near-side" or "far-side" stop shall prevail at street intersections. The tramway has resorted to the popular vote before in order to settle controversies, particularly in connection with running express cars, and has accepted the majority opinion. The policy of frankness with the public and willingness to meet the majority opinion in cases of controversy is doing a great deal to keep the company in popular favor.

Courthouse Don'ts for Trainmen.—N. W. Funk, of the legal department of the Louisville (Ky.) Railway, in the last issue of *Trolley Topics*, makes the following suggestions under the heading of "Some Courthouse Don'ts." "Don't come in and take the witness stand chewing gum. Don't take the witness stand and chew your finger nails. Remember your testimony is the chief factor in our success or failure in the courthouse. A bad impression made on the jury by you cannot be cured by twenty disinterested witnesses. Many an employee will wonder why we have lost a case when we apparently have all the testimony. I have given you the answer. Don't guess wildly at speed. I have heard men state on the witness stand that they were going 1 m.p.h. between intersections. A man walking slowly goes

3 m.p.h. This sort of testimony will wreck the best defense in the world."

Unsuccessful Attempt to Compel Operation of Toronto Line.—The city of Toronto, Ont., through Works Commissioner Harris, made an unsuccessful attempt on Aug. 29 to secure from the Ontario Railway Board an order compelling the Toronto Railway to give a service on the new Ossington Avenue line. Mr. Harris pointed out that the delay of the city in completing the roadbed was due to difficulty in obtaining material, and claimed that but for the company's delay in laying tracks in the first place, the work would have been all done now. In any event, the line was quite safe for operation. Chairman McIntyre observed that the company held otherwise, and when the commissioner announced that he could produce evidence to prove that the line was safe, Mr. McIntyre informed him that the board's engineer had gone over the line and took the same view as the company's engineers. The operation of the line, accordingly, must wait until the city has completed the work of paving, which will be about Sept. 1.

Not a Fatal Accident in Louisville in a Year.—Results of the first year during which the safety-first work of the Louisville (Ky.) Railway has been in effect have been compiled by the company and show that the efforts of company and employees in eliminating accidents have been effective. In the first place the report shows that not one fatal accident has occurred on the city lines during the year, in the face of the fact that the company operated its greatest mileage and in the year carried a total of 100,000,000 passengers. There were four fatal accidents in the first half of 1914, before the safety-first movement got under way. In 1913 there were fifteen fatal accidents; in 1912 twelve, and eleven each in the two preceding years. In the case of the Louisville & Interurban Railroad the record is marred by one death, for which the coroner's jury held the company blameless. During the previous year there were six fatal accidents on the company's lines. Not only was the number of injuries to pedestrians reduced, but the movement was otherwise beneficial. Street car collisions were reduced by 62 per cent, and there was a reduction of 50 per cent in reports of persons falling in boarding or leaving cars or after leaving them. One item, the number of collisions between street cars and automobiles, shows an increase. This is attributed to the large increase in the number of automobiles. Since the inauguration of the police crusade against reckless motor driving, however, there has been a marked decrease in these accidents. There are sixteen lines in the city, covering 87½ miles of road. The mileage during the year was 11,897,848.

What the Interurban Has Done for Indianapolis.—Commenting recently on the growth of 38 per cent for Indianapolis and on 19 per cent for St. Louis during the last census decade the *St. Louis Republic* said: "A number of railroad systems are managed from St. Louis. Not one road of any size is managed from Indianapolis. St. Louis lies just across the Mississippi from the greatest deposit of good steam coal adjacent to any American city; Indianapolis gets its coal from considerable distances. St. Louis has a river channel connecting it with the sea; Indianapolis has no navigable water. St. Louis is located on rolling hills of great scenic beauty and giving ideal drainage; Indianapolis is as flat as the top of a dinner table. St. Louis is far from any other large city; Indianapolis has achieved its remarkable growth within 183 miles of Chicago. St. Louis has two important universities; Indianapolis has none. St. Louis is a wealthy city; Indianapolis has almost no large fortunes. St. Louis is the world's center in a number of lines of manufacture; Indianapolis has many small, prosperous shops, but few large ones. Fast interurban trolley lines have made it easy for the people of a circle of 250 miles in diameter to visit Indianapolis. In the streets of the capital, the man from Fort Wayne rubs elbows with the man from Terre Haute; the shopper from Columbus meets her old school friend from Logansport. A trolley map of Indiana looks like the spokes of a wheel whose hub is the city of Indianapolis. A city without great wealth, without large industries, without a university, without navigable water, without coal, without natural beauty of site, has grown because it made it easy for its neighbors for 100 miles around to drop in before dinner, per trolley car, and leaving after an early supper, to get home by bedtime."

Personal Mention

Mr. Daniel M. Shepler has been appointed superintendent of the Pekin (Ill.) Street Railway, controlled and operated by the city.

Mr. John M. Padgett, formerly with the Associated Press and the *Republican* at Denver, Col., for about two years with the *Daily Capital* at Topeka, Kan., has been appointed to the claims and publicity department of the Illinois Trac-tion Company. He will handle work for the company's railways at Topeka, Wichita and Atchison.

Mr. William D. Ainey, Montrose, Susquehanna County, has been appointed chairman of the Public Service Commission of Pennsylvania by Governor Brumbaugh. Mr. Ainey, who was appointed a commissioner in the spring of 1915, has been acting as chairman, being the junior in the commission. The new chairman has served as a United States Congressman and was a member of the House committee on foreign relations. He was born at New Milford, Pa., and was graduated from Mansfield Normal School and Lehigh University. He was District Attorney of Susquehanna County for two terms until elected as a Congressional representative.

OBITUARY

J. C. Espy, superintendent of transportation of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, is dead as a result of wounds self-inflicted, presumably in a fit of despondency brought about by the death of his wife and by his own failing health. Mr. Espy was for some time a locomotive engineer on the Lake Shore Railroad. Sixteen years ago he entered the service of the Cleveland, Painesville & Eastern Railroad as a motorman. After several years of service he was promoted to dispatcher, and five years ago was made superintendent of transportation of the company.

John R. Graham, president of the Bangor Railway & Electric Company, Bangor, Me., and one of the most prominent public utility men in the East, died at his summer home in Intervale, N. H., on Aug. 24. Mr. Graham was born in the north of Ireland in 1847. During the Civil War he served in Massachusetts infantry and cavalry regiments, and after the close of hostilities established a shoe factory at Quincy, Mass., which has since been continued by his sons. Mr. Graham entered the street railway field at the reorganization of the Quincy Street Railway and when that company was merged with the Old Colony system he became a vice-president of the latter. He was a member of the first rapid transit committee of the Massachusetts Legislature, established at Boston in 1893, was a member of the Quincy City Council for two terms, a director of the Quincy Electric Light & Power Company, and a trustee of the Quincy Savings Bank. In 1902 Mr. Graham engaged in the rehabilitation of the electric railway, lighting and power system at Bangor in association with the banking houses of J. & W. Seligman, New York, and E. W. Clark & Company, Philadelphia. Mr. Graham was also closely identified with the acquisition of the electric railways now forming the system serving the region between Waterville, Me., Lewiston and Bath. More recently he was instrumental in the formation of the Cumberland County Power & Light Company, Portland, Me., which now operates the electric railway and central station service of Portland and the surrounding region. Mr. Graham was a director of the Merrill Trust Company, Bangor; Union Trust Company, Ellsworth; president of the Bangor Power Company, the Orono Water Company, the Bar Harbor & Union River Power Company, and the Graham Realty Company. In July, 1914, he entertained the New England Street Railway Club at his hotel in Bangor and at his private and experimental farms in the outside country, the occasion being one of the most memorable in the history of the organization. He was an honored guest at meetings of the Massachusetts Street Railway Association, and in 1914 received a loving cup at a dinner at Young's Hotel, Boston, from former associates in the Legislature. Mr. Graham was twice married and leaves his second wife and ten children by his first marriage, one of whom, Mr. Edward M. Graham, is assistant to the president of the Bangor company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Boise Valley Traction Company, Augusta, Me.**—Incorporated in Maine to construct and operate a railway by steam, electric or other motive power. Capital stock, \$1,000,000. Officers: Franklin P. Ferguson, Brooklyn, N. Y., president; E. M. Leavitt, Winthrop, treasurer, and E. L. McLean, Augusta, clerk.

***Salem-Pennsgrove Railway, Salem, N. J.**—Incorporated in New Jersey to construct a line from Salem to Pennsville and Pennsgrove. Incorporators: Arthur B. Smith and Isaac S. Smashey, both of Salem. [July 31, '15.]

FRANCHISES

Ceres, Cal.—The Tidewater Southern Railway has asked the Council for a franchise to extend its tracks through Ceres.

North Andover, Mass.—The Bay State Street Railway has received a franchise from the Council to extend its double tracks on Sutton Street, North Andover.

Westborough, Mass.—The Worcester Consolidated Street Railway has asked the Council for a franchise to relocate its track on Main Street, Westborough.

Cleveland, Ohio.—Petitions have been filed with the City Clerk of Cleveland asking for a referendum vote on the franchise granted the Cleveland, Akron & Canton Terminal Railway for a four-track freight subway under East Fifty-fifth Street, Cleveland. [July 31, '15.]

Portland, Oregon.—City Attorney La Roche has been asked by Commissioner Daly to prepare a council resolution, declaring the franchise of George F. Huesner to construct an interurban electric line from Kenton to the West Side Business District forfeited, and providing for proceedings to confiscate the \$10,000 bond furnished by Mr. Huesner to guarantee construction of the line. The franchise was granted to Mr. Huesner two years ago, and called for the completion of the line and starting of operations within eighteen months. This time has expired and nothing has been done toward construction. Mr. Huesner recently asked for an extension of time, which was denied by the Council.

Parkersburg, W. Va.—The Kanawha Traction & Electric Company has asked the Council for a franchise to lay double track on Murdock Avenue from Pottery Junction to Thirteenth Street.

TRACK AND ROADWAY

Phoenix (Ariz.) Railway.—This company has commenced taking up its double track on Roosevelt Street preparatory to changing the line to Fourth Street.

***Jonesboro, Ark.**—Plans are being considered to construct an electric railway from Jonesboro to Nettleton. Frank Weisbord, Indianapolis, Ind., is interested.

Pacific Electric Railway, Los Angeles, Cal.—The committee which was appointed a year ago to secure rights-of-way and subscriptions of money for condemnation proceedings, the purchase of depot sites, etc., which are to be turned over to the Pacific Electric Railway as a bonus for which it agrees to construct an electric railway to traverse the southeast section of Glendale and the eastern part of Tropic, reports that it has sufficient deeds to rights-of-way and subscriptions of cash to insure the construction of the road. The line will be 2½ miles long. A site has been purchased for depot, carhouse and park purposes. The total value of the depot sites and rights-of-way to be turned over to the company is estimated to be \$51,000.

Castro Point Railway & Terminal Company, Richmond, Cal.—The Railway Commission of California has issued an order authorizing the Castro Point Railway & Terminal Company to issue 890 shares of its capital stock of a par value of \$100 a share, to repay Blake Brothers \$18,403, the San Francisco Quarries Company \$21,070, and its attorneys

\$490. The balance is for other advances and for new construction on 2 miles of railway from the San Pablo quarry to a connection with the Richmond Belt Line Railway, all in Richmond. The company's capital stock is \$100,000, divided into 1000 shares, of which 110 are outstanding. It has no other evidences of debt.

Municipal Railways, San Francisco, Cal.—The Board of Works has contracted for all material needed for the construction of the Municipal Railway lines on Church Street and across Golden Gate Park, and is awaiting action by the Board of Supervisors before proceeding further. The contract for 9800 ties has been awarded to the Navarro Lumber Company. The Board of Supervisors has yet to decide the route for the line across the park, and has to declare whether the city will lay tracks on Market Street, from Church Street to Van Ness Avenue, or use the United Railroads tracks for that distance.

Illinois Traction System, Peoria, Ill.—This company suffered the loss of 300 ft. of track and the Coon Creek bridge, near Clinton, during the recent severe storm and high waters.

Aurora, Elgin & Chicago Railway, Wheaton, Ill.—This company is being urged to build a loop through the western part of Elgin. Such a loop would connect the Wing Park line with the North State Street line. The laying out of the North State Street tracks, which are now being placed on a lower level on account of new paving, is in accordance with the loop idea.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—This company is making preparations to build 60-ft. concrete poles to be used on its high-tension lines, especially at railroad crossings. Wooden poles have been used heretofore. The company has for the last five years used concrete poles of shorter length which have proved entirely satisfactory.

Tri-City Railway, Davenport, Iowa.—Double tracks are now being laid by this company on Seventeenth Avenue between First and Seventh Streets, East Moline. It is more than likely service to Campbell's Island will be discontinued on Oct. 15.

Hutchinson (Kan.) Interurban Railway.—Work has been begun on the extension of this company's tracks, which will be used by the Arkansas Valley Interurban Railway as an entrance to Hutchinson. The Hutchinson Interurban Railway will lay the track from Avenue A and Lorain Street south across its tracks, east on Carey Boulevard to the section line ½ mile east of Lorain Street and north to a connection with the Arkansas Valley Interurban line extending west from Burrton.

Wichita Railroad & Light Company, Wichita, Kan.—New track is being laid by this company on East Douglas Avenue east of Rock Island Avenue, Wichita. Concrete foundation will be used.

Cumberland Traction Company, Edmonton, Ky.—Work has been begun on this company's proposed railway between Edmonton and Elizabethtown. It is stated that the Greenup Electric Company, Elizabethtown, will supply the power for operating the cars and that the plans contemplate the completion of the road by the first of the year. Burkesville, Ky., interests are quoted to the effect that if the Cumberland road is built they will construct a 30-mile line from Burkesville to Edmonton to connect with it. [Aug. 21, '15.]

***Topsham, Me.**—Fred B. Teeling, Litchfield, is interested in a project to construct an electric railway from Topsham to Monmouth, to connect with the Lewiston and Waterville division of the Lewiston, Augusta & Waterville Street Railway at or near Tacoma. Mr. Teeling has presented his proposition to A. H. Ford, general manager of the Lewiston, Augusta & Waterville Railway, who has signified his interest in the project. Under the plan outlined, the road would start at Topsham or Brunswick, extending to Bowdoinham and Richmond Corner, through Litchfield, crossing the Lewiston, Augusta & Waterville Street Railway at Tacoma, thence to Litchfield Mills and Monmouth, a distance of 33 miles.

Worcester (Mass.) Consolidated Street Railway.—Work has been begun by this company repairing its tracks on Berlin Street, Clinton.

Detroit, Almont & Northern Railroad, Detroit, Mich.—Operation has been begun on this company's extension between Almont and Imlay. The company is being urged to extend its lines to Brown City and Marlette.

Grand Rapids (Mich.) Railway.—Work will soon be begun on the construction of an extension of this company's line on Plainfield Avenue, Creston, from the present terminal at Ann Street, N. E., to Knapp Street, N. E.

Jackson Light & Traction Company, Jackson, Miss.—The work of reconstructing this company's tracks on West Capitol Street has been completed.

***Opheim, Mont.**—It is reported that North country farmers, allied with the American Society of Equity, contemplate the construction of an electric railway from Opheim to Nashua. It is also reported the towns of Glentana and Baylor will join in the movement, which has for its principal object the gaining of more efficient means of transportation for farm products to the main line of the Great Northern Railway.

Public Service Railway, Newark, N. J.—Work has been begun by this company on the relocation of its tracks on Springfield Avenue between the Elmwood Avenue loop and Forty-third Street, Irvington. The tracks are to be shifted to the center of the roadway.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—In connection with the repaving of West State Street between Calhoun and Prospect Streets this company is laying new ties and rails. The rails will be welded.

United Traction Company, Albany, N. Y.—This company is reconstructing and laying considerable new track in Albany and Troy. Rail weighing 70 lb. to the yard and 7-in. T-rail weighing 95 lb. to the yard is being used.

International Railway, Buffalo, N. Y.—New tracks will be laid by this company on Elmwood Avenue between Potomac and Forest Avenues, Buffalo. The company has agreed to remove one of the tracks of the abandoned line on Young Street between Main and Delaware Streets, the city to remove the other track. E. G. Connette, president of this company, announces that the directors of the system have decided to provide trolley service along Bailey Avenue on the east side. Tracks will be laid for part of the distance next year. The company has a franchise in the street and a year's extension was granted by the last Legislature.

Piedmont & Northern Railway, Charlotte, N. C.—Work has been begun by this company on the construction of a 1-mile extension at Charlotte to the Elizabeth Mill.

Cleveland (Ohio) Railway.—Work has been begun by this company on the extension of its Buckeye Road line from East 116th Street to East 130th Street, Cleveland.

Lake Shore Electric Railway, Cleveland, Ohio.—Plans are being considered by this company to double-track its line on West Erie Avenue, Lorain, between Ashland Avenue and the city limits.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Plans are being made by this company to relay its tracks on Long Street and Main Street, Columbus. Mayor Karb has declared that the company must use grooved rails on these streets.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Work has been begun by this company on the construction of its extension on East Washington Street, New Castle, to Cascade Park.

Oklahoma & Interstate Railway, Oklahoma City, Okla.—The Central States Construction Company has been chartered in Oklahoma with a capital stock of \$100,000 to build this company's proposed line to connect Tulsa, Miami, Collinsville, Joplin and other points. The incorporators are John R. Rose, J. R. Eldridge, G. C. Jones and A. G. Ritz, all of Oklahoma City. [April 17, '15.]

Bridgeburg, Ont.—It is reported that the plan to construct a hydro-electric line to connect Bridgeburg, Ridgeway and Fort Erie is being revived. W. G. Athoe, Ridgeway, is interested.

Philadelphia, Pa.—The contract for the construction of the City Hall station section of the Broad Street subway under City Hall and Market Street has been awarded by A. M. Taylor, director Department of City Transit, to the Keystone State Construction Company for \$1,700,000. The

contract for the construction of nearly 5 miles of concrete foundations for the steel supports of the Frankford Elevated Line from Callowhill Street to Unity Street was awarded to James D. Dorney for \$142,490. Construction work will be begun on Sept. 13. [July 10, '15.]

Scranton & Binghamton Railway, Scranton, Pa.—This company's extension from Foster to Brooklyn is practically completed and it is expected that cars will be running to Montrose by Dec. 1. Much progress has been made during the year on the extension to Binghamton.

Nashville & Eastern Railway, Nashville, Tenn.—DeKalb County has authorized the sale of \$150,000 thirty-year 4 per cent bonds, the proceeds to be invested in an equal amount of the capital stock of the Nashville & Eastern Railway. This practically assures the construction of the line between Nashville and Smithville. The bonds are to be issued and sold after the railway is completed and in operation. The Nashville, Chattanooga & St. Louis Railway will be electrified from Nashville to Lebanon and will connect with the extension to be built to Smithville. Charles Edwards, Nashville, is interested. (July 31, '15.)

Dallas (Tex.) Consolidated Electric Street Railway.—City Commissioners of Dallas have passed an ordinance granting Edward T. Moore of this company and associates ninety days' extension in the franchise ordinance covering trackage privileges for the proposed union interurban passenger station at Wood Street and Jackson Street. The plans include the erection of a ten-story building to be used as a terminal interurban station and office building for street car properties. Mr. Moore stated that several interurban interests entering Dallas have come to an agreement for the joint use of an interurban station and financial negotiations necessary to procure the money have progressed to an extent to assure the beginning of the work within ninety days, for which the extension was asked.

Galveston (Tex.) Electric Company.—Repairs have been begun on this company's line on which part of the track was completely washed out by the recent storm. A single-track pile trestle will be immediately built from Virginia Point on Galveston Bay to replace part of the causeway wrecked by the storm.

Houston, Richmond & Western Traction Company, Houston, Tex.—This company has awarded a contract to Moore & Son, Lufkin, to grade from the Brazos River to the city. [July 24, '15.]

Rutland Railway, Light & Power Company, Rutland, Vt.—New 80-lb. rail has been received and work will be begun at once by this company on the reconstruction of its tracks on Strongs Avenue, Rutland, between Madison Street and City Hall. The company is also placing new ties at various points on the main line.

***Richmond, Rappahannock & Northern Railway, Richmond, Va.**—Surveys have been begun by C. L. Ruffin, Richmond, for this company's proposed line from West Point to Urbana, 17 miles. The company was incorporated on July 30 with \$300,000 common stock and \$200,000 preferred stock. Officers: Warner Moore, president; H. L. Lewis, vice-president; R. H. Bruce, treasurer, and James Mullin, Jr., secretary.

Virginia Railway & Power Company, Richmond, Va.—This company plans to build double track on Fourteenth Street from Mayo Bridge to Cary Street, Richmond.

Olympia Light & Power Company, Olympia, Wash.—Mayor Mottman and the Council have ordered this company to move its tracks on East Fourth Street from the north side to the center of the street.

***Washington Electric Company, Olympia, Wash.**—The State Highway Commission has granted to this company a railroad right-of-way 15 miles southeast of Chehalis in Lewis County, where it is reported an electric line will be built.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—An ordinance has been passed by the Council for the establishment of the proposed grade separation at Argo, and a date will be set in the immediate future for the hearing of the interested property owners and various railroad companies involved, which include the Puget Sound Traction, Light & Power Company, the Oregon-Wash-

ington Railroad & Navigation Company, the Great Northern Railway and the Chicago, Milwaukee & St. Paul Railway. The work will cost approximately \$450,000, and will be borne by the companies named. A concrete tunnel 1700 ft. long is included in the improvement.

Monongahela Valley Traction Company, Fairmont, W. Va. It is reported that this company is considering the extension of its line to New Martinsville to connect with the lines along the Ohio River. One survey is between Mannington and New Martinsville and another between Lumberport and New Martinsville, but no decision has been reached as to which will be used. Either of them would connect Fairmont and Clarksburg with the western terminus. Another proposed line extends from Weston to Glenville, and another line which has been surveyed extends from Clarksburg to Buchannon. Surveys have also been made between Clarksburg and Philippi and some rights-of-way have been secured.

Ohio Valley Electric Railway, Huntington, W. Va.—It is reported that this company plans to build an extension from Ashland, Ky., north to Russell.

Pan-Handle Traction Company, Wheeling, W. Va.—This company is repairing its track between Warwood and Wellsburg.

SHOPS AND BUILDINGS

Shore Line Electric Railway, Saybrook, Conn.—Plans are being prepared by Cudworth, Woodworth & Thompson for the construction of a new carhouse to be erected by this company on the site of its old carhouse in Thamesville, destroyed by fire last fall. The building will be 60 ft. x 250 ft. and will be constructed of brick.

Joliet & Eastern Traction Company, Joliet, Ill.—Work will be begun soon on the new carhouse of this company at Frankfort, Ill. The building will be of concrete construction and will provide storage for four cars. There will also be repair shops in the building where cars of the eastern division will be repaired.

Pekin (Ill.) Municipal Railway.—This company will build a carhouse on the ground recently purchased for that purpose in the Rosedale addition to Pekin.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company has completed and is now using a new modern passenger and freight station at Rantoul, Ill.

Arkansas Valley Interurban Railway, Hutchinson, Kan.—Plans are being prepared by Crowell & Van Meter, Wichita, for the construction this fall of a \$10,000 terminal by this company. The structure will be two stories high and will be of brick and stone.

New York Municipal Railway Corporation, Brooklyn, N. Y.—With the approval of the Public Service Commission for the First District of New York, the New York Municipal Railway Corporation has awarded to John Thatcher & Son the contract for the construction of stations in connection with the third-tracking work on the Broadway elevated line in Brooklyn, for \$320,325. The contract calls for the construction of stations at Hewes Street, Lorimer Street, Flushing Avenue, Myrtle Avenue and Broadway, Kosciusko Street, Gates Avenue, Halsey Street and Chauncey Street. All these stations are on the Broadway line between Havemeyer Street and East New York, where the third-tracking work is already under way. The commission has awarded the contract for the construction of station finish on Section No. 2 of Routes Nos. 36 and 37, the Astoria elevated line in Queens Borough, to Charles Meads & Company, the lowest bidders, for \$268,192.

Cleveland & Youngstown Railway, Cleveland, Ohio.—Petitions have been filed with the city clerk of Cleveland asking for a referendum vote on the franchise granted this company for a freight terminal at Broadway and Orange Avenue, Cleveland.

POWER HOUSES AND SUBSTATIONS

Shore Line Electric Railway, Saybrook, Conn.—This company has completed plans for a brick and concrete power station, 45 ft. x 80 ft., 25 ft. in height.

Illinois Traction System, Peoria, Ill.—This company has received four new transformers for use in its substations at St. Joseph, Ill. The plant will be rearranged at the time the new transformers are installed.

Manufactures and Supplies

ROLLING STOCK

Alton, Granite & St. Louis Traction Company, St. Louis, Mo., is reported as expecting to purchase new cars of a modern type to be used between Alton and St. Louis.

Manchester (N. H.) Street Railway has placed in service a new closed car, built in its shops. Another car is being constructed and will probably be in operation in two months.

Anaconda (Mont.) Street Railway, noted in the *ELECTRIC RAILWAY JOURNAL* of Aug. 21 as having ordered six new 50-ft. cars, has placed this order with the St. Louis Car Company.

Danville Street Railway & Light Company, Danville, Ill., has placed the third pay-as-you-enter car in service in this city, this car to be run on the West English and the Soldier's Home line.

Southwestern Gas & Electric Company, Texarkana, Tex., is about to receive three 21-ft. steel car bodies which have been built by the St. Louis Car Company. They are of the pay-as-you-enter, double-end vestibule type, equipped with GE-54 motors and Brill 21-E trucks. On May 15 this railway placed in service three cars built by the same company. These cars are of pay-as-you-enter type, 28 ft. long, double truck, steel bodies, equipped with GE-201 motors and Brill 39-E trucks.

TRADE NOTES

Esterline Company, Indianapolis, Ind., manufacturer of "Golden Glow" headlights, has received an order for the complete equipment of the Seattle, Renton & Southern Railway's cars with thirty SR-95 "Golden Glow" headlights. An order for equipping half of the interurban cars of the Atlantic City & Shore Railroad, using "Golden Glow" T-128 headlights has also been received. The Savannah Electric Company has ordered twelve SR-95 headlights for its suburban cars.

Duff Manufacturing Company, Pittsburgh, Pa., manufacturer of the well-known Barrett lifting jacks, is building an extension to its main factory building, 150 ft. x 125 ft. in width. With the extension the main building will be 625 ft. by 125 ft. wide, and will contain the most modern equipment. A 5-ton bridge transfer crane and monorail conveying system is also being installed, together with considerable additional equipment. All equipment has been purchased and is being installed.

Bertram Smith, well known in the storage battery business for the past fifteen years, has been appointed manager of the Detroit office of the Edison Storage Battery Company. About a year and a half ago Mr. Smith joined the Edison interests as assistant manager of the Edison Storage Battery Supply Company of San Francisco, the distributor for the Edison nickel-iron-alkaline battery on the Pacific Coast. Directly previous to his connection with the Edison company he was manager of the battery department in the Chicago branch of the United States Light & Heating Company. He was formerly secretary and treasurer of the National Battery Company of Buffalo until its consolidation with the United States Light & Heating Company. In order to better serve its customers in eastern Michigan, as well as Ohio and adjoining territory, the Edison Storage Battery Company recently moved its Cleveland office to Detroit, where it has located in the new David Whitney Building.

Thomas W. Casey has been elected vice-president and a director of the National Pneumatic Company of Chicago and New York. Mr. Casey will also be general sales manager of the company and will have charge of the sales office which will be located in New York City. Mr. Casey has been prominently identified with the popularizing and exploiting of the prepayment car from its inception into the United States, having come from Montreal with the first pay-as-you-enter car which was exhibited at the American Electric Railway Association convention held in Columbus, Ohio, in 1906. Mr. Casey was general manager of the Pay-as-You-Enter Car Corporation, and after the merger of that corporation with the Pay-Within Car Company

in March, 1911, when the Prepayment Car Sales Company was formed to carry on the work, Mr. Casey was elected president of the new organization, and since that time the work has been carried on under his direction. Having decided to enter the manufacturing field he has joined the force of the National Pneumatic Company. Mr. Casey has a thorough knowledge of the electric railway business, especially in the mechanical line, having been connected with the Montreal Street Railway Company for upwards of seventeen years in various positions, being general purchasing agent at the time he resigned from that company. Prior to going with the Montreal Street Railway Company Mr. Casey was employed on the Canadian Pacific construction under the late Sir James Ross.

ADVERTISING LITERATURE

D. & W. Fuse Company, Providence, R. I., has issued a catalog relating to the design and construction of its inclosed fuses. The catalog discusses the external appearance of the fuses, describes the link constructions of the various kinds, explains the filling of the fuses and finally contains an account of the mechanical methods employed in their construction.

S. K. F. Ball Bearing Company, New York, N. Y., has issued Bulletin No. 15 on the characteristics of ball bearings for automobile worm drives. The catalog describes the simplicity of the bearing construction, the ease with which the bearings are mounted and assembled, and their noiseless operation and efficiency. The proper method of lubrication for worm drives and the calculation of end thrust and radial loads are also explained.

The Engineer, London, England, has issued its regular annual directory, the contents of which include an abridged index to the editorial columns of *The Engineer*, from January to December, 1914, a list of technical terms in French, German, Italian and Spanish for use as a foreign buyers' guide, an iron and steel trade directory and buyers' guide, including telegraphic addresses and telephone numbers of firms included in the buyers' guide and a list of standard and new technical books.

E. I. duPont de Nemours Powder Company, Wilmington, Del., has issued a valuable booklet entitled "Road Construction and Maintenance." Although the booklet deals broadly with this subject, it includes information of special interest and value to the electric railway construction and maintenance of way engineer, owing to the helpful instructions which it contains on the proper methods of blasting for the construction of rights-of-way and pole holes. The process of loading poles for blasting is clearly described with the aid of diagrams, and illustrations of the blasting supplies required.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued a reprint of an article which appeared in the July issue of *The Foundry*, and entitled "How Titanium Aluminum Bronze Is Produced." The article is well illustrated with views of the modern equipment and facilities of this company's plant at Niagara Falls, N. Y., for making and testing this valuable alloy. This company makes a full line of brass and bronze castings and also specializes in the manufacture of high-grade bronzes. Where special requirements are presented use is made of a research or experimental foundry department equipped with both coke and electric melting furnaces and controlled, as is the production foundry, by complete chemical, physical and microscopical laboratories.

Carnegie Steel Company, Pittsburgh, Pa., has issued a pamphlet entitled "Structural Beams," second edition, dated as of August 1st, 1915, which covers a new line of sections supplementary to the American standard beam sections. In recent years, especially in the construction of modern office buildings and buildings intended for light machine shop work, it has frequently been found desirable to use deeper beams than required for safe carrying capacity as determined by the floor loads required by the building laws of various cities with a result that the full strength of a standard beam section is not always developed. It was natural that in the endeavor to meet this condition designers should follow the outline of the American standard profiles which, in turn, were based on the original German

normal profiles, and in consequence light weight sections have been made heretofore with the flanges of the same width and taper but somewhat thinner and also with thinner webs than the minimum weight American Standard sections. The beam sections illustrated in this pamphlet constitute, however, a radical departure from those profiles as regards width, slope and thickness of flanges: the 24-in. beam with a width of 9 in. as compared with the 7-in. of the American Standard section. The 12-in. beam has a flange width of 6 in. as compared with the 5-in. width of the American Standard section. The 27-in. beam is made with the same flange width as the 24-in. beam, but the flange widths of the other sections follow the depths in a gradual sequence; the slope of the flanges is uniformly 1 in 11. The carrying capacities of these sections are theoretically somewhat less than the carrying capacities of the corresponding minimum weight standard sections. Pound for pound, however, the metal has equal if not greater efficiency with the additional advantage that the new sections have somewhat greater lateral stiffness due to the greater width of their flanges. There is no 20-in. beam in this new series which is graduated by intervals of 3 in. in the sizes, 12 in. deep and over.

NEW PUBLICATIONS

Resuscitation from Electric Shock, Traumatic Shock, Drowning, Etc. By C. A. Lauffer, M. D., medical director, Westinghouse Electric & Manufacturing Company. Second edition, enlarged. John Wiley & Son, Inc., New York. 90 pages. Price 50 cents.

This is a revised reprint of the paper presented by the author before the Philadelphia Electric Company Section, N. E. L. A., in 1912, and explains the prone-pressure or Schaefer method of inducing artificial respiration, including complete directions for self-instruction.

The Act to Regulate Commerce Construed by the United States Supreme Court. By Hubert Bruce Fuller. John Byrne & Company, Washington, D. C. 585 pages. Buckram, \$6.

This book is intended to collate and to discuss the decisions of the United States Supreme Court on the interstate commerce act. While primarily a treatise for lawyers, it is not beyond profitable perusal by laymen who desire to know how rate, traffic and similar questions arising under the act are being construed by the court of last resort. To railroad officers, shippers, bankers and investors, the book is an invaluable compilation of needed information.

Graphical Determination of Sags and Stresses for Overhead Line Construction. By Guido Semenza, consulting engineer, and Marco Semenza, electrical engineer, both of Milan, Italy. Translated from the Italian by C. O. Mailloux. McGraw-Hill Book Company, Inc., New York. Twenty-four pages of text, with many inserted charts printed on bond paper. Cloth, \$3 net.

This set of charts with explanations is designed for the use of men engaged in line construction. The charts are plotted from formulae which are derived and explained for the benefit of those who care to follow the theory, but the charts can be used without a knowledge of this theory. The method followed by the authors includes provision for ice and wind loads, temperature changes, difference in elevation of spans, etc.

Alternating Current Electricity and Its Application to Industry. By W. H. Timbie, head of the Department of Applied Science at Wentworth Institute, and H. H. Higbie, professor of electrical engineering at the University of Michigan. John Wiley & Sons, Inc., New York. 534 pages. Cloth, \$2 net.

The authors have incorporated in this text-book on the elements of its subject the results of years of successful teaching experience. It represents an earnest attempt to assist students to secure a working grasp of a difficult subject by making it tangible. The book abounds in analogies and practical problems, and wherever possible pictures of commercial apparatus are introduced. While intended as a text-book for students with a very elementary knowledge of the elements of electricity, it could be studied with profit by electrical workers who are familiar with the fundamentals of physics, algebra, geometry and trigonometry.